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Did You Ever Think of Pausing to Size Yourself Up?

Many a man never thinks of pausing to size himself up, to formulate a definite plan for his life, or to consider his mental equipment. Yet the same fellow would heartily condemn a mine where no plans were made for the future and no thought was paid to the condition of the equipment.

ABOUT A YEAR AGO A FIREBOSS IN a mining institute arose to object to the study of English grammar in mining classes, on the ground that he could see no need of it for a practical workingman. He showed clearly enough by that statement that he was unwilling to advance—to grow in the most effective direction, namely, to develop his ability to think and to express his thoughts intelligently.

Had he stopped to reflect, he would have remembered that in order to advance above the grade of fireboss, he must pass the state examinations for mine foreman or assistant. Even with a good practical knowledge of mining, men fail year after year to pass the examinations because they are unable to express their thoughts accurately, due to lack of training in the application of the simple principles of English grammar. If we are to make a success of life, we must willingly grasp the opportunities to learn to develop brain-power.

Just as a man must exercise his body to develop it, so he must study to develop his brain. And when a man makes up his mind to study, he can best spend his first efforts in trying to find out what real study means.

Study is not the mere memorizing of facts, however valuable these facts may be. A certain fireboss in Pennsylvania has spent many earnest hours, yes years, in committing facts to memory in the belief that he was studying. Yet the piecemeal knowledge that he has acquired by those efforts corre-

sponds to the parts of a great engine spread out on the manufacturer's assembling-room floor. No matter how excellent they are in themselves, the parts are of no real use until they are fitted together in their proper relation to each other to make up a single workable unit. It is this ability then to acquire facts and place them in their proper relation to each other that constitutes real study and useful mental effort.

It is remarkable that those men who have studied most seem to realize so much more than other men the decided advantages of study. Not long ago, a patient in a doctor's office remarked upon the amount of studying that doctor was doing; the patient being aware that the doctor had spent over seven years in this country and abroad on the professional part of his education before he began to practice. The doctor promptly replied:

"The minute I stop studying I shall begin to fall behind my fellows." Recently, a superintendent remarked: "I've studied some from time to time, but now I am so busy I do not even take the covers off the mining papers I get." He has lost his sense of proportion, and he is standing still.

One reason why the educated man has always recognized the benefits of continued study has been the training he has received in how to study. But today, with the great number of schools and institutes open to every class of mining men, there is coming to be less reason for any one's failing to secure the advantages of their guidance.

Study

is more important today than ever before. The opportunities for study are far greater. When any man thinks he has reached the point where study is no longer necessary, he has ceased to progress; either he is stagnating or else he is going backward.

Electricity in Coal Mining

BY ERIC A. LOF*

This article is the longest ever published in one issue of COAL AGE; however, it is complete as it stands, and is of such great interest and technical value, we especially recommend it to the attention of all coal men from miner to president.—EDITOR.

SYNOPSIS—Enormous advances have been made in the use of electricity in mining operations in the past few years. The principal applications of electric power in coal-producing work are here described, together with the advantages and disadvantages of the different types of motors available for the given service.

While electricity has been used in mining work for nearly 30 years, or almost since the practical introduction

The advantages of using electric power for mining operations are now so fully realized that no other system whatever is being considered when a new installation is planned, while hundreds of old mines are changing over to this modern method of power application.

The nature of mining operations necessitates that the machinery must be located at many different places, while on the other hand a large number of small units may have to be used, resulting in a low efficiency. Electric power can be cheaply produced in a single generating station and transmitted to any distance within the mining district without excessive increase in the cost, provided that a suitable pressure is used for the transmission. The power consumed in each district or by any individual machine can be measured by suitable meters or instruments, and in this manner any excess consumption can at once

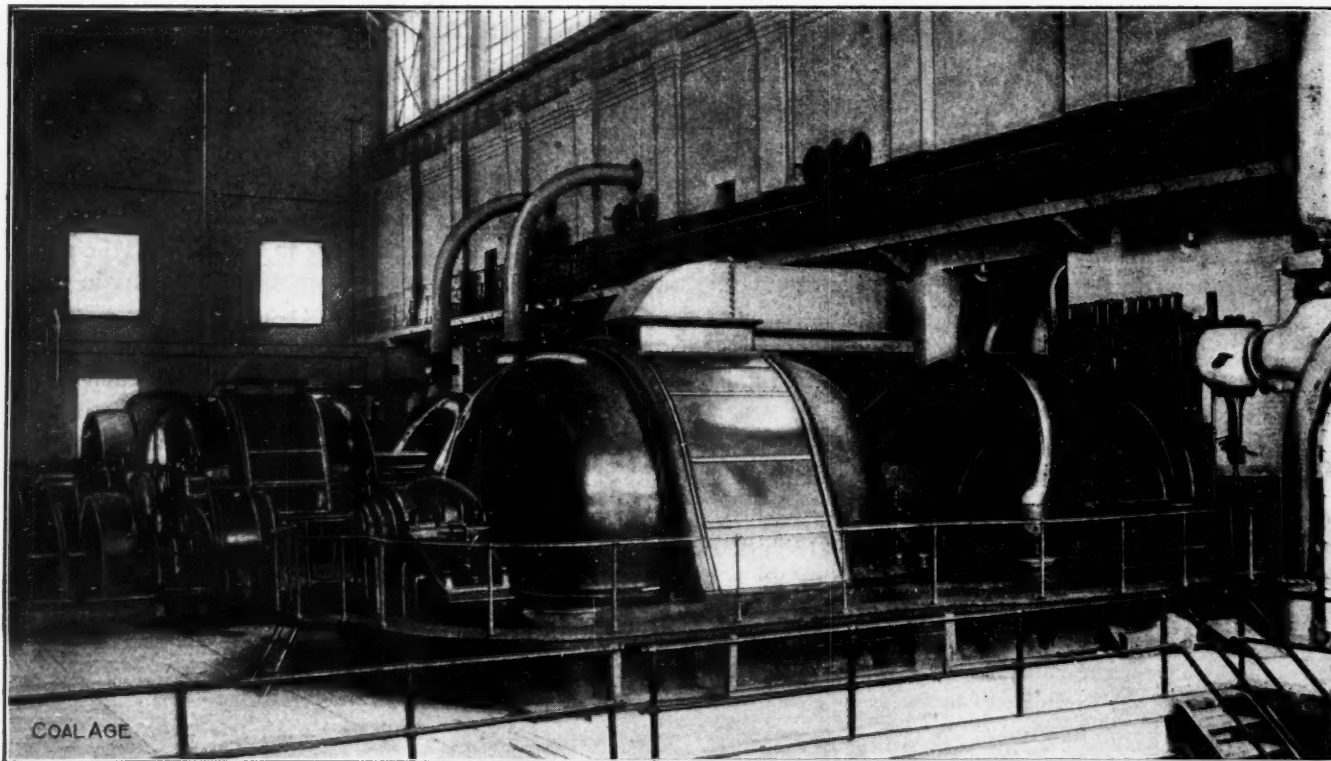


FIG. 1. INTERIOR OF LEHIGH NAVIGATION ELECTRIC CO.'S PLANT, AT HAUTO, PENN. A STEAM-ELECTRIC PLANT AT THE MINES FOR HIGH TENSION, LONG-DISTANCE TRANSMISSION

of the electric motor, it is especially during the past decade that the enormous advance of this system has taken place. In no other field than the coal-mining industry has electricity been of greater benefit to mankind, and only through its medium has it been possible to meet the ever-growing demand for fuel.

On the other hand, it has prevented or at least greatly reduced the use of animal power in mines, the cruelty of which could almost be considered as a crime, and this also to a great extent spurred the engineers to devise a means whereby this abuse could be abolished.

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be detected and the defect remedied, while an accurate record can be kept on the different operations.

There is no restriction as to the location of the machinery, as the distributing lines can be carried to any part of the mine and occupy but little space. They eliminate long and expensive steam and air lines, with which the danger of breakdown and the difficulty encountered in keeping up the necessary working pressure increase for every extension to the service. With the flexible electric system, on the other hand, additions and alterations can always be made without any difficulty whatsoever.

Electric motors are highly efficient, even down to the smallest sizes. They take but little space and are readily

adapted to the machines which they are to drive. Perfect control is also possible at all times, and simple automatic safety devices can readily be installed.

POWER SUPPLY

The power supply for a coal operation can be obtained in many different ways. Steam power can be generated directly at the mine, and the stations may either be of a capacity just sufficient to supply the need of that mine alone, or they may be of a considerably greater capacity, in which case the surplus power may be transmitted electrically to profitable market centers. On the other hand, power may be purchased from hydro-electric or other public-service companies.

As a rule, it is generated directly at the mine, and steam turbines having an exceedingly high efficiency are used as prime movers. Their steam consumption is low, being for condensing units sometimes more than 50 per cent. better than for the single slide-valve engines former-

the demand for low-grade coal is limited. The Lehigh mines produce enough refuse coal to maintain the continuous generation of 100,000 kw., and this is the ultimate capacity for which the new station at Hauto, Penn., has been designed, the present capacity being 37,500 kw. The electric energy is being transmitted at a pressure of 100,000 volts.

The Appalachian Power Co.'s plant, on the New River, in Virginia, Figs. 2 and 3, is, on the other hand, an example of the advantages which may be derived from using hydro-electric power for coal-mine operation, this company furnishing power to the Pocahontas coal fields.

In the supplanting of steam power, produced at the mouth of the pit, with hydro-electric energy generated 50 to 70 miles distant, the question of power cost is not entirely the ruling factor, although in many cases the purchase of central-station energy is cheaper than individual production. Central-station energy relieves the coal operators from the power-plant investment, which can

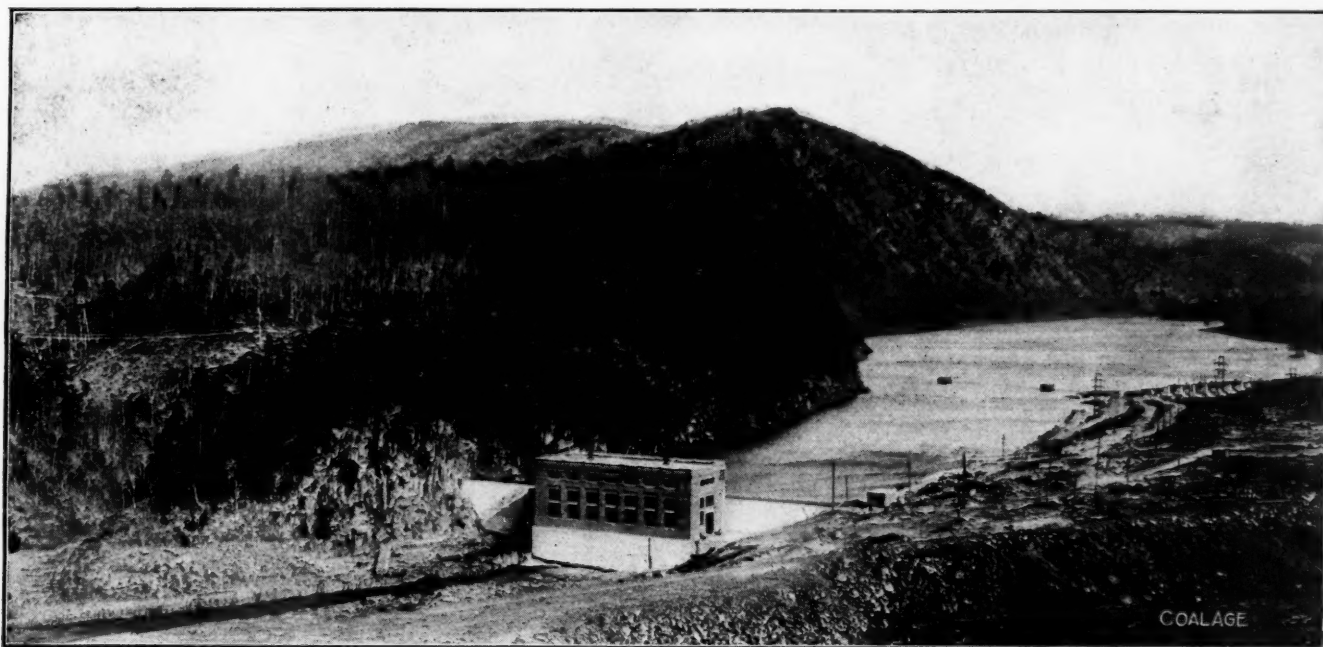


FIG. 2. ONE OF APPALACHIAN POWER CO.'S STATIONS TRANSMITTING ELECTRIC POWER TO THE POCAHONTAS COAL FIELDS

ly quite generally used in mining districts, and from 10 to 15 per cent. better than for modern compound condensing engines. The space they occupy is small, which in turn reduces the cost of the station.

The new and immense power plant of the Lehigh Navigation Electric Co., Fig. 1, represents the beginning of a most important step toward the economic use of coal directly at the mines. By transforming the heat energy of the fuel at the point of origin into electrical energy and transmitting this to the consumers at profitable market centers, one of the biggest factors that enters into the cost of coal—the transportation thereof—will be eliminated.

Still another economic saving is, however, realized, in that the enormous waste product, consisting of coal particles and dust which pass through the screens and are entirely unmarketable, can be successfully burned under the boilers by providing specially designed furnaces therefor. The cost of transportation for low-grade coal is approximately the same as for the higher grades, and consequently

be used for other profitable improvements. The service is of a much higher quality than is, as a rule, obtained in an ordinary individual plant. This is a factor of importance in that it greatly improves the operating conditions of the mine.

Often formerly it was necessary for the coal operator to establish his own power plant in inaccessible locations, to which water had to be pumped against considerable heads. Not infrequently also this water was of poor quality for boiler use, resulting in excessive maintenance costs. It was difficult to retain skilled engineers and station operators, owing to the remoteness of many of the mines from community advantages. A definite contract for central-station energy insures the operator against these unfavorable conditions.

CHOICE OF SYSTEMS

Two systems are available for the distribution of electric power in mines; i.e., the alternating-current and the direct-current, the choice depending upon the particular

conditions of the project. For smaller installations, with short distributing lines, the direct-current system can be used, the motor of this type being well adapted for the operation of hoists, mining locomotives, blowers, etc.

When, on the other hand, power has to be distributed over greater distances, as in larger mining districts with scattered shafts, the alternating-current system will generally be found more advantageous. Due to the possibility of using a higher voltage, a more economical distribution can be obtained, and the simplicity of the induction motor makes this system especially suitable for the severe service encountered in mining work. For the operation of mining locomotives or other machinery requiring it, direct current can readily be obtained by motor generators or rotary converters, so that in general it can be said that the alternating-current system offers many advantages for mining operations.

The selection of the proper voltage at which the power should be generated depends to a great extent on local conditions. Mining motors are, as a rule, operated at from 220 to 550 volts, but occasionally 2300 volts is used for pump motors, etc. The restrictions imposed by the commutators of direct-current motors for mining work limit the potential of such a system to a maximum of 550 volts. Furthermore, the electrical pressure which is in use in one part of the mine generally determines that for the entire installation when the direct-current system is used.

A working potential of 550 volts, however, is only economically feasible for mines whose workings above and below ground have a maximum extent of a few hundred yards, while on the other hand it is as high as is advisable for small motors working underground, considering the safety of the operators.

When the extent of the mines is such that the above

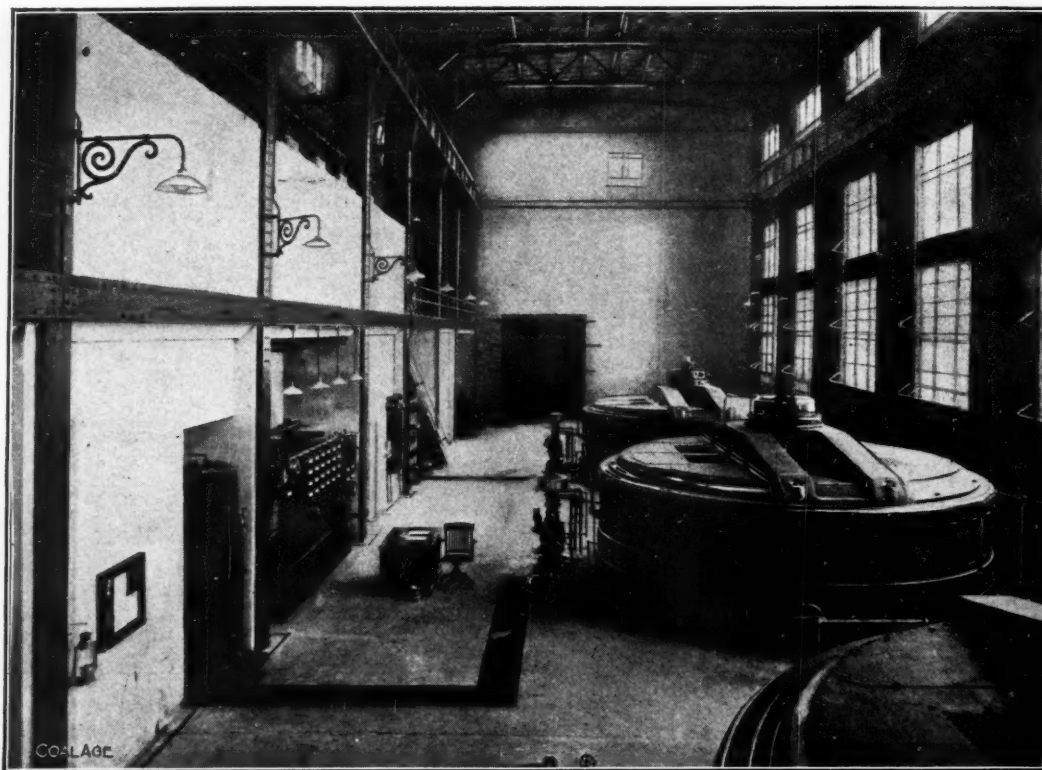


FIG. 3. INTERIOR OF THE STATION SHOWN IN FIG. 2, SHOWING THE VERTICAL GENERATORS

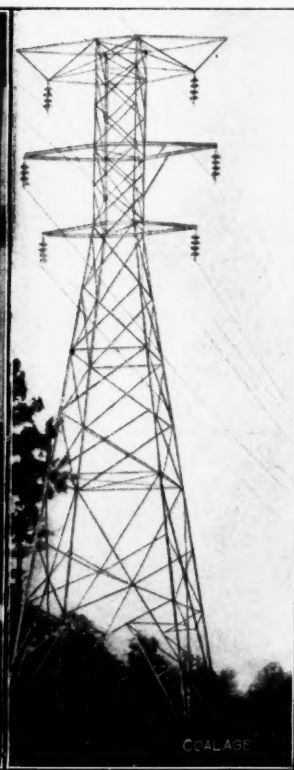


FIG. 4. STEEL TOWER FOR HIGH-TENSION TRANSMISSION

The two standard frequencies in this country are 60 and 25 cycles per second. Where purely alternating current is used, the former is preferable. The speeds of 25-cycle induction motors for general application are practically limited to 750, 500 and 375 r.p.m., while the corresponding speeds for 60-cycle motors would be 1200, 900, 720, 600, 514, 450 and 400 r.p.m. Twenty-five-cycle motors could, of course, be wound with two poles, giving a speed of 1500 revolutions, but this is rarely done, except in the very small sizes. The 60-cycle frequency also permits its use for lighting. If, on the other hand, the distribution is done wholly or partly with direct current, 25 cycles may prove the best, the lighting in such a case being obtained from the direct-current circuits.

voltage is not sufficiently high, the alternating-current system of transmission or distribution must be resorted to. With this system the voltage can be transformed up or down as may be desired in static transformers, operating at a very high efficiency. It is, therefore, possible on the one hand to transform up to such values that the transmission can be carried out economically for any practicable distance, while, on the other hand, the pressure can be reduced to any extent necessary for its safe use in small motors, for lighting, etc.

TRANSMISSION AND DISTRIBUTION

For transmitting the energy over long distances, bare overhead wires of either copper or aluminum are used. They should preferably be supported by means of insula-

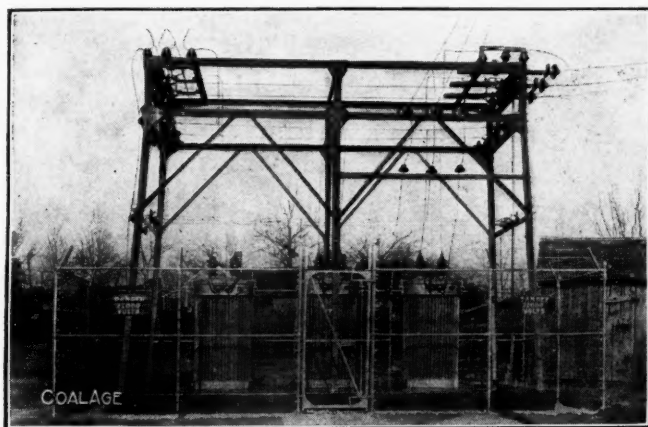


FIG. 5. TYPICAL OUTDOOR SUBSTATION FOR TAPPING POWER FROM HIGH-TENSION TRANSMISSION LINES

tors on substantial steel towers, Fig. 4, if the transmission is to be of a permanent character. Such towers may be of considerable height, allowing greater spans, and thus a smaller number of supports, while the life and reliability of the system are greatly increased.

Double-circuit lines are preferable to single circuits. The same weight of copper divided into two conductors and supported by slightly modified towers would considerably reduce the chance of a shutdown, with only a small additional cost for towers, a second set of insulators and the labor of stringing the second circuit.

One or more substations, depending on the number and location of the different mines, will be required for housing the step-down transformers, the converting apparatus, and the control equipment. The design of the substation building and the contained apparatus should be made with a view to economy and simplicity of operation,



FIG. 6. A MODERN ELECTRIC MINE LOCOMOTIVE

so as to minimize the number of necessary attendants.

The design is fixed by the kind of service to be given, whether the distribution is purely either alternating or direct current, or a combination of both. The first system necessitates naturally the simplest design, as it only involves the installation of step-down transformers, and such stations are nowadays often of the outdoor type, i.e., the apparatus is installed as shown in Fig. 5 without any protecting building. If a conversion to direct current is to be made, rotary converters with transformers, or motor-generator sets with or without transformers, must be provided and a building is necessary for their protection.

The secondary distribution should be laid out in the best possible manner, both from an economical and operating standpoint, and the construction should be most substantial, so as to prevent any possible shutdown due to poor workmanship. For the overhead distributing circuits, the conductors are either bare or insulated with

weatherproof braid. They are supported on insulators mounted on regular wooden poles with crossarms.

For the underground construction in the mines, it is highly desirable that the wires be erected out of easy reach. Frequently, however, the headroom available is such that this cannot be done. Owing to the excessively damp and acidulous atmosphere in many mines, it is quite difficult to maintain a high degree of insulation on the wires, and hence in many cases the low-pressure wiring is run bare, supported on glass or porcelain insulators.

Where the danger of coming in contact with the wires is great, especially in the case of high-voltage conductors, they should be thoroughly insulated and metal covered, the armoring not only protecting the insulation from deterioration, but also from mechanical injury. It seems also advisable that even with lead-covered cables, the insulation should be nonhygroscopic and as nearly as possible proof against the action of mine acids, because there is always the possibility of a defect appearing in the lead sheath, either through a faulty joint, through electrolytic action, or otherwise. If paper insulation is used, even a small opening of this sort may admit enough moisture to destroy the insulation at that point and cause a breakdown.

HAULAGE

The first electric locomotive for mine haulage was put into operation in 1887. From that time up to 1900, the progress of utilizing electric power for mine haulage was rather slow, but after that year it increased at a rapid rate, so that now many thousands of electric locomotives are in operation in this country alone.

Steam locomotives for underground coal mining are out of the question, on account of the smoke and steam produced by them and the danger of fire. The use of lo-

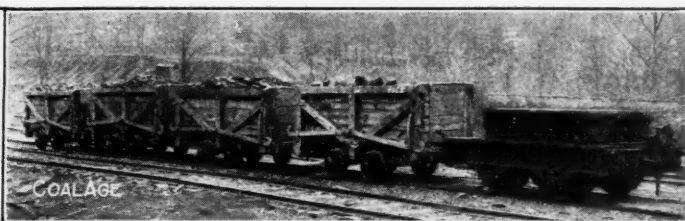


FIG. 7. STORAGE-BATTERY LOCOMOTIVE WITH LOADED TRIP

comotives driven by internal-combustion engines is increasing, but these are also accompanied by the danger of fire, and their operation is not as reliable as that of electric machines. Compressed-air locomotives are less economical, and only occasionally come into consideration where explosive gases may be present on haulage roads.

As a fact, however, the sparks that may be caused by the setting of the brakes does not make them any more safe for such a service than the electric locomotive. Even the mule, which has been one of the chief competitors of the electric haulage, is now being displaced by gathering locomotives, and actual experience has shown that the cost of hauling by the electric method is from 50 to 75 per cent. cheaper than by mules. A consideration of the cost of feeding, the large percentage of killed or injured, the additional amount of air necessary in underground work, and finally the large number of mules and drivers required to perform the same amount of work as a locomotive, makes this evident.

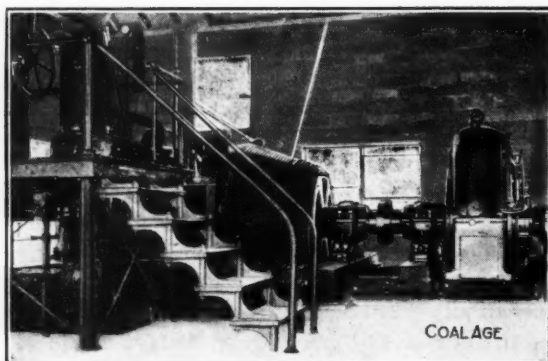


FIG. 8. DIRECT-CURRENT 250-HP. MOTOR DRIVING DOUBLE CONICAL-DRUM HOIST

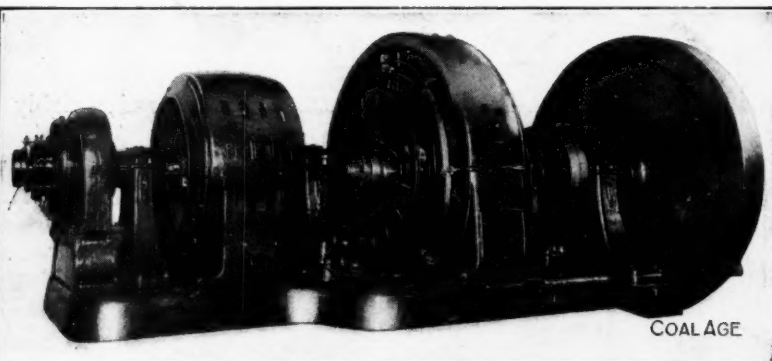


FIG. 9. FLYWHEEL MOTOR-GENERATOR EQUALIZING SET WITH DIRECT-CONNECTED EXCITER

Direct-current locomotives are generally recognized as standard, although in rare instances single-phase locomotives are used, due to the fact that the supply system is alternating current, and the magnitude of the work does not warrant the installation of converters. The use of three-phase locomotives is not to be recommended, as in such a case each track would require two separate trolley wires, with the rails comprising the third leg of the three-phase circuit.

The two-motor locomotive, Fig. 6, has come to be generally recognized as the standard type for mine work, and actual tests have demonstrated that this equipment will pull from 10 to 20 per cent. more than a single motor mechanically connected to the two axles. On the other hand, a higher efficiency is also realized due to the series-parallel control. So, for example, when a slow speed is required, this is efficiently attained by running the two motors in series.

With the single-motor drive, slow speed can only be secured by inserting a large resistance in series with the motor, and the current consumption would be twice that taken by the two-motor equipment under series operation. Furthermore, should one motor for some reason or other be damaged, it would entirely cripple the single-unit machine while that supplied with two motors would still be capable of performing a large part of the work.

INSIDE AND OUTSIDE FRAMES

From the constructional viewpoint, there are two general forms of this type of locomotive, one in which the side frames are placed outside of the wheels, and the other in which they are placed inside of the wheels. For a given track gage, the outside-frame type allows the maximum space between the wheels for the motors and other parts of the equipment, renders the journal boxes more accessible and gives somewhat greater space at the operating end for the motorman.

The inside-frame type restricts to a certain extent the space available for motors and other equipment, but secures a minimum overall width—a construction that is necessary in those mines where the props are set close to the track or the space outside the rails is otherwise limited. The wheels being outside the frame, this type, in case of derailment, is somewhat more readily replaced.

There are two standard methods of mounting the motors: "In tandem," i.e., one motor placed between the axles and the other between the forward axle and the front end frame, and "central," or where both motors are placed between the axles. The "tandem" arrangement

permits of a short wheel base and is adopted for the light- and medium-weight locomotives, as these are usually required to operate over sections of the track having short-radius curves.

On the heavier locomotives the motors are mounted "central." The longer wheel base is permissible in this case for the reason that the heavy machine operates on the main haulage roads which, as a rule, are comparatively straight and have easier curves. With either arrangement the locomotive frame is proportioned to give an equal distribution of the weight between both pairs of driving wheels.

Motors may also be "end" mounted by placing them in the spaces between the axle and the forward and rear end frames respectively. This permits the minimum wheel base, but is very seldom used and is adopted to meet exceptional conditions only.

From the viewpoint of operation, there are also two kinds of locomotives employed in coal mining; i.e., those used for main haulage and those used for gathering. This is particularly the case in mines where the headings have attained considerable length and where the output can be handled most economically by concentrating the trips over the main haulage road into trains of a capacity sufficient for a 20- or 25-ton locomotive.

On well laid tracks having 50-lb. or 60-lb. rails, four-wheel, two-motor locomotives of this weight operate successfully. Where, however, light rails exist, it is inadvisable to concentrate this weight on four drivers. Instead, therefore, of a single 20-ton locomotive, two 10-ton machines are coupled together and operated as a single unit, which, while developing the same tractive effort, has its weight distributed on eight drivers.

The tandem locomotive is also adapted for those cases where conditions of operation require trains of a certain definite tonnage and the gage is so narrow that two motors of sufficient capacity cannot be used.

The method of coupling locomotives in tandem is extremely simple and permits the complete control of motors, brakes and sand valves of both units from the operating end of one.

In order to avoid the necessity for installing overhead lines on side tracks which are only used temporarily, the gathering locomotives intended for this service are equipped with a cable drum. Before the machine leaves the overhead trolley line, the flexible cable is hooked on behind one of the line clamps. The locomotive is now able to travel for a further distance of about 500 ft. A small electric motor, which is coupled to the cable drum,

is constantly under current. This holds the cable tight as it runs out, and winds it up again at the necessary speed on the return journey.

If the gradients of the side tracks are so steep that it is no longer economical for the locomotive to traverse them, a winding drum may be provided, which enables the driver to draw in trucks from a distance of about 300 ft.

For gathering service and in other instances where for any reason it is not permissible or advisable to install an overhead trolley wire, the storage-battery locomotive, Fig. 7, may be advantageously employed. Such a locomotive possesses all the well known advantages appertaining to the ordinary electric machine, as compared to other varieties and animal haulage, among which are the following:

It consumes power only when in actual operation, and can be handled by any man of ordinary intelligence. It is ready for use at all times of the day, providing it has been given its full charge during the preceding night or idle period. It has large momentary overload capacity, and possesses an easy and perfect system of control. It can be run underground and in other localities where the smoke and fire risks of the steam locomotive would forbid its use or where the fire hazard of the trolley type is dangerous. It can be charged from a relatively small generator, as the charging period is distributed over several hours and the dynamo consequently is relieved of heavy overloads which would otherwise be incidentally demanded by trolley locomotives. The mechanical and electrical parts are few and simple, resulting in low maintenance cost. It requires minimum head room in tunnels and mines. It can be installed on track systems where animal haulage is now in use without the necessity of stringing wires, erecting poles or bonding rails.

HOISTING

Of equal importance with the electric locomotive in the successful operation of a mine is the electric hoist. This was, however, not extensively introduced for mining work until about 1900, or not until long after the locomotive. Its importance is evident when it is considered that the main shaft represents to a certain extent the principal artery of the entire mine. It is the connecting link between the coal-handling systems above and below ground. The whole of the material mined must pass through the shaft on its way from the various points of production to the loading station. Any interruption or breakdown in the hoisting machinery is equivalent to a stoppage in the whole coal-getting work of the mine. In fact, its efficiency determines the maximum output of the development.

It is possible to arrange both the underground haulage system and the surface-railway network according to the requirements, and thus increase the efficiency as desired, and at the same time provide working reserves. This is, however, not always the case with the hoisting system.

A second or third hoisting plant would require the sinking of a second or third shaft, which would entail large extra construction costs, which, in most cases, would be economically impossible. The technical problem is, therefore, to cover the greatest possible area of a mine with one main shaft, and to install a hoist therein which combines maximum efficiency with high economy and thorough reliability. Endeavors to solve this problem have led, during the course of a century, from hoists driven by flowing

water to steam engines, and from the latter to electric motors.

The successful introduction and the surprisingly rapid growth of electric hoisting are therefore primarily attributable to the fact that the electric motor is excellently adapted to hoisting work. There is scarcely another form of service which is more intermittent or in which the power required varies so greatly.

The two principal classes of electric mine-hoist equipments are: The direct-current motor operated from its own motor-generator set by generator field control, and the induction motor. The direct-current motor lends itself well to direct connection, as the characteristics of

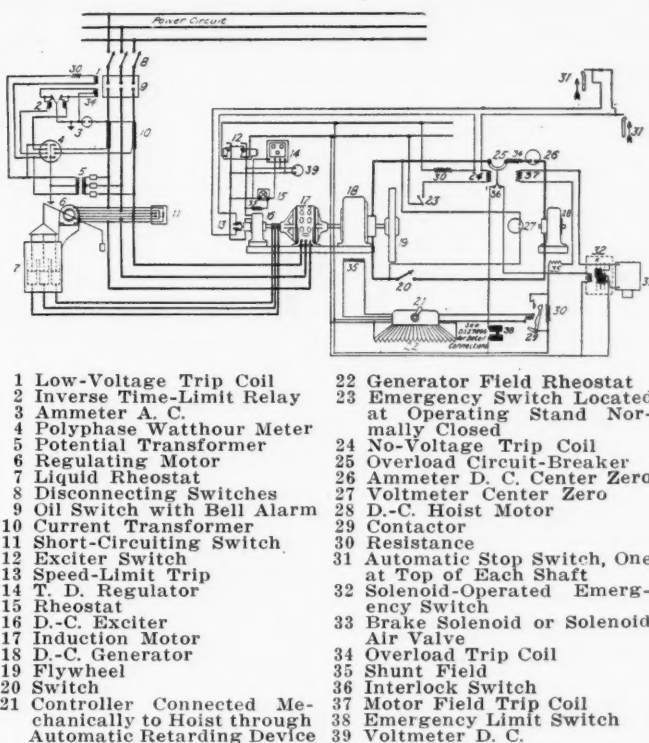


FIG. 10. DIAGRAM OF CONNECTIONS FOR DIRECT-CURRENT MINE HOIST WITH FLYWHEEL MOTOR-GENERATOR SET

slow-speed motors of this type are excellent. The cost of a direct-connected motor will, in practically all cases, be higher than that of a geared motor, but in some instances this is largely offset by the saving in gearing, etc. Where, however, a considerable saving can be made by using a geared motor and where the mechanical advantages of a direct-connected hoist are not an important consideration, a geared direct-current motor should be employed.

Such a motor, Fig. 8, should be separately excited and shunt-wound and the current for the same obtained from a separately excited generator of similar type, both machines being driven by a direct-coupled induction motor, Fig. 9, where the source of supply is alternating current, as is almost invariably the case.

THE CONTROL OF THE HOIST MOTOR

The control of the hoist motor is effected by regulating and reversing the exciting current of the direct-current generator, thus varying the voltage impressed upon the motor terminals, Fig. 10. The current for the motor and dynamo fields is supplied from the direct-connected

exciter, and in the case of the motor it is maintained constant. As the rapidity of hoisting is practically proportional to the voltage impressed upon the motor armature, the controlling gear is arranged so that the speed will be directly proportional to the distance by which the controlling lever is moved away from the neutral position. This system of hoisting has the great advantage that the rheostatic losses are reduced to a minimum and that the operator has perfect control over the motor.

In many cases it is highly desirable to reduce the instantaneous peak loads and equalize the current input to the hoist. This is especially true where the power charge is based wholly or partly on the maximum demand, and any practicable method, therefore, by which energy may be taken from the line and stored during periods of light load and discharged when the hoist load is heavy, makes it possible to greatly reduce the maximum input and consequently the charge for power.

The simplest method of effecting this is by adding a flywheel to the motor-generator set, previously described. In order to permit the flywheel to take care of the peaks, and equalize the load, the speed of the set must be varied according to the demand for power. This is accomplished by an automatic slip regulator connected in the secondary circuit of the induction motor, which, in this case, must be of the phase-wound type.

In its most common form this regulator consists of a liquid rheostat. The resistance is varied by means of movable electrodes suspended from an arm mounted on the shaft of a small induction motor which is set on the top of the rheostat tank. The regulator motor is connected in series, either directly or through series transformers, with the induction motor of the flywheel set. It is adjusted so that its torque opposes the weight of the electrodes, which are counterbalanced to reduce the size of the regulator motor to a minimum and to permit adjustment for different values of the line current. When this exceeds the amount for which the regulator is adjusted, the torque of the motor overbalances the weight of the electrodes, lifting them, and thus inserting resistance in the rotor circuit of the induction motor of the set. This causes it to slow down and allows the flywheel to assist in driving the generator during the peak load.

THE INDUCTION-MOTOR HOIST

The second important class of electric hoisting systems is, as previously stated, driven by induction motors. Excessively low-speed motors of this type and of moderate capacities do not show particularly good electrical characteristics. For large-capacity hoists at high rope speeds, using as small a drum diameter as is consistent with good practice, a direct-connected induction motor is, in some instances, entirely feasible, and a number of such equipments are in actual operation abroad. However, the great majority of induction-motor-driven hoists now in use and which will be installed in the future are and will continue to be of the geared type.

The induction motor must be of the phase-wound type, and the speed control is accomplished by cutting in or out resistance in the secondary circuit. Drum controllers with grid resistances are used up to about 200 hp., while between this and 400 hp., it is customary to provide a complete magnetic-contactor control. Above 400 hp., the liquid rheostat is usually employed as a secondary resistance and control.

This rheostat has stationary electrodes, and the area of immersion and therefore the resistance is varied by raising or lowering the level of the liquid. By means of a small centrifugal pump, mounted on the rheostat, the liquid is pumped continuously into the electrode chamber and overflows a movable weir into the cooling chamber. With the weir in its lowest position the electrodes are only slightly submerged and the resistance is high. As the control lever is moved over toward the running position in either direction it raises the weir, which causes the electrode chamber gradually to fill to a level corresponding to its height. This submerges the electrodes, thereby decreasing the resistance and accelerating the motor.

By moving the control lever to any desired intermediate position, thereby lifting the weir part way, the liquid may be raised to an intermediate level. By this means an infinite number of partial-speed running points can be obtained. The time required for the pump to fill the electrode chamber serves to limit the maximum rate at which the acceleration can take place.

When the weir is swung down to the lowest position, it opens one entire side of the electrode chamber so that the liquid falls out, instead of being required to flow out through a restricted orifice. The rapid emptying thus obtained is particularly advantageous in cases where it is necessary to reverse the motor in order to retard the hoist.

For equalizing the load taken by an induction-motor-driven hoist, a flywheel motor balancer may be used. This consists of a shunt- or compound-wound direct-current motor, connected to a heavy flywheel and carrying a direct-connected exciter. The motor balancer is floated indirectly across the incoming line circuit, being tied in by means of a rotary converter or motor-generator set. A regulator actuated by the line current controls the direct-current motor field, so that when the power taken by the hoist drops below the average, the field is automatically reduced, causing the flywheel set to speed up and absorb power from the supply system and store it in the flywheel. When the load on the hoist motor exceeds the average, the operation is reversed, the flywheel set slows down and power is returned to the system through the rotary converter.

PUMPING

Due to the severe service conditions ordinarily encountered in the operation of pumps in mines, the superiority of electric-motor drive has been more thoroughly demonstrated in this particular industry than in any other. The motors occupy a small amount of space, operate with high efficiency, are easily controlled, and their location in the mine may be limited solely by the work to be done.

Where conditions of extreme dampness prevail, the motors may be so constructed as to be absolutely waterproof. For temporary or intermittent service, portable pumping sets may be used either mounted on trucks or skids, and provided with cables for connection to the feeder or trolley circuit. The use of the electric motor is the only method by which a portable pumping set can be easily and economically operated in mines.

The main pumps are mostly of a large capacity and are used for emptying the sumps where the water from various parts of the mine is collected, either by gravity or by small auxiliary portable pumps. If these reservoirs are of a sufficient size for storing the water during the

day, the large pumps may be operated at night and the load factor greatly improved.

The question whether reciprocating or centrifugal pumps are to be used is difficult to determine offhand. If the amount of water to be handled is small and the head high, the reciprocating pump, Fig. 11, has generally been selected, although modern installations indicate that the centrifugal pump may be successfully used for heads up to 2000 ft. When a large amount of water has to be pumped against a small head, centrifugal pumps, Fig. 12, are always preferable.

Reciprocating pumps are less affected by gritty water, which may cause serious damage to the guide vanes and impellers of centrifugal pumps. The efficiency of reciprocating pumps is also higher than that of centrifugal pumps, but this is partly counterbalanced by the higher efficiency and power factor of high-speed motors employed to drive the latter as compared to the low-speed motors employed for driving the reciprocating machines.

The volume of water delivered by a reciprocating pump can be varied either by changing the speed or through a bypass valve. The latter method is, of course, less economical on account of the waste of water, and speed variation is therefore preferable. In starting large pumps the water may, however, be delivered through a bypass until the motor is up to speed, when the valve in this passage is gradually closed and the water delivered into the pipe system. The load at starting, therefore, only consists of the friction losses, and usually does not exceed 25 per cent. of the full-load torque.

EITHER TYPE OF MOTORS MAY BE EMPLOYED

Either direct- or alternating-current motors may be used for driving reciprocating pumps. When of the former class, the compound-wound type is generally selected for single-acting pumps on account of their rather pulsating load, while for duplex and triplex pumps, having steadier characteristics of power demand, the shunt-wound motor is used to advantage. Both squirrel-cage and phase-wound induction motors are suitable, the latter as a rule being selected where it is desirable to reduce the starting current to a minimum or where a somewhat variable speed is required.

Synchronous motors may also be used for driving large pumps of moderate speed, and are admirably adapted for such service, while, on the other hand, their characteristics are such that by over-exciting their fields they may be made to considerably improve the power factor of the system. Bypass valves should preferably be provided on the pumps, when this type of motor is employed, so as to reduce the starting current as much as possible.

In selecting the motor equipment for a centrifugal pump, its characteristics as affected by the service conditions must be carefully predetermined, and in some respects the operating features of this type of water lift are entirely opposite to those of reciprocating pumps.

With constant speed an increase of the resistance against which the reciprocating pump operates, increases the water pressure and, therefore the load on the motor, while with the centrifugal pump an increase of the resistance reduces the load. The volume of water delivered by a reciprocating pump is not affected by the reduction of the head, but the required power is lessened. A reduction of the head with a centrifugal pump, however, increases the volume of water, and as the efficiency at the

same time goes down rapidly, the load increases. It is, therefore, of importance to know what this overload, caused by a reduction of the head, amounts to and the duration of the same; and the capacity of the motor should, as a rule, be governed by the low and not the high-head conditions.

The starting condition must be given careful consideration in selecting the motors. In starting a centrifugal pump the discharge valve may be entirely closed until the motor comes up to speed, so that the latter may start as nearly light as possible. As the machine accelerates, the water is churned around in the casing, causing the motor to load up as it approaches full speed, when, with pumps of the usual design, it takes from 40 to 50 per cent. of full-load torque to drive it even though pumping no water.

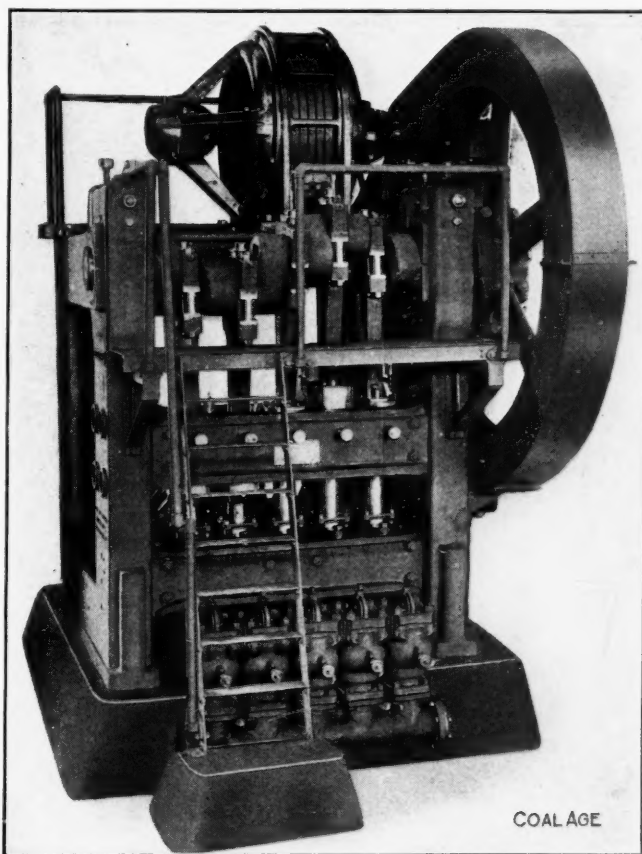


FIG. 11. MOTOR-DRIVEN RECIPROCATING MINE PUMP

Shunt-wound, direct-current motors and either squirrel-cage or phase-wound induction motors are well adapted for this type of pump and will readily meet the above conditions. A synchronous motor, however, may lead to difficulties unless precautions are taken in designing the squirrel-cage starting winding with a sufficiently low resistance so that it will develop enough torque to pull the motor into synchronism. When this is done, however, the starting current is increased and a compromise must usually be made.

The advantages of electricity for mine pumping are especially evident in the case of sinking pumps. These are intended for being lowered in a vertical shaft when flooded mines are to be drained. They are either mounted on a float or suspended from a cable so as to always operate at the surface of the water. The motors for driving these pumps can be either of the direct- or alternating-

current type, but as they are often liable to be entirely submerged the inclosed induction motor is preferable on account of its simple construction and the absence of moving contacts. In the operation of these pumps the load increases inversely as the head and the motors should be so designed that their efficiency increases with the increasing water pressure.

VENTILATION

The ventilation of mines differs somewhat from other ventilation problems, in that a variable air supply is essential, while, on the other hand, an uninterrupted service is the primary requisite. For the latter reason, mine fans should, if possible, be direct-connected to the driving motor, thus avoiding the use of belts. This is entirely feasible and economical with high-speed fans, while with large slow-moving units, changed over from steam to elec-

the "electric-air drill." The latter is exactly what its name implies—an air drill distinctly, the operating power of which is electricity. It is not, however, merely an air drill driven by an individual electrical compressor, but a complete device—pulsator, hose lines and drill—making a closed circuit in which the same air is repeatedly compressed and expanded, utilizing instead of wasting its expansive power and eliminating all compression losses.

The pulsator is a motor-driven air compressor of unique design—a vertical, duplex, single-acting, self-oiling machine—without inlet or discharge valves, and, therefore, not limited by these parts in either speed or endurance. Motors are used for either direct or alternating current, motor and pulsator being connected by reduction gears. The whole equipment is mounted on a steel truck with wheels which may run on a standard mine track, or may simply roll on the floor in room, tunnel or heading. When

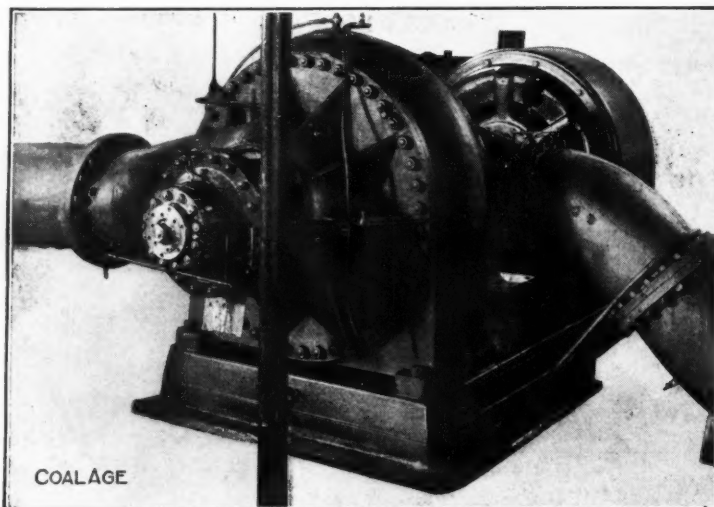


FIG. 12. MOTOR-DRIVEN CENTRIFUGAL MINE PUMP

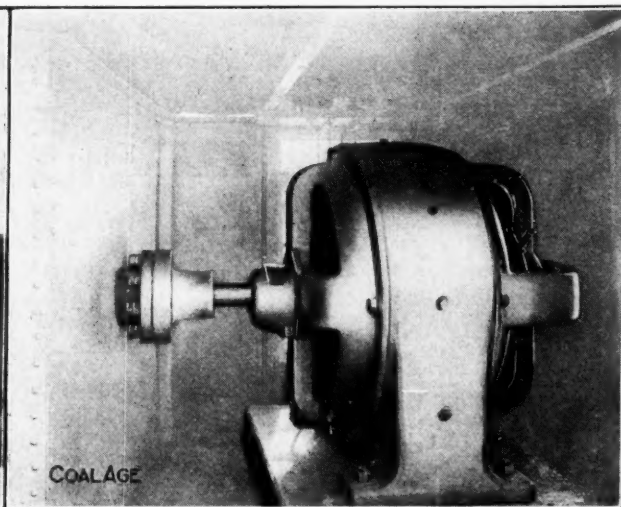


FIG. 13. DIRECT-CURRENT MOTOR DRIVING A MINE FAN

tric drive, the retention of belting is often necessary, due to the difference between the speed of the fan and that which would prove most satisfactory for the motor.

For driving centrifugal mine fans either direct- or alternating-current motors may be used, the choice depending upon the nature of the power supply. The application does not differ materially from centrifugal pumps, the load increasing as the speed rises, and unless some sort of shuttering is provided, the motor will be fully loaded when it comes up to speed.

With a direct-current supply, shunt motors, Fig. 13, are generally used, the speed regulation being accomplished by field control. With alternating current, the phase-wound induction motor should be employed, and in this case the speed control is accomplished by inserting resistance in the secondary winding.

The condition of starting should be considered in selecting the control equipment for mine-fan motors. With large fans, having a high inertia, the time required for acceleration is comparatively long, and the starting resistances for such cases should, as a rule, be of a larger size than that ordinarily required.

DRILLS

While numerous purely electric drills have been invented and many are in actual operation, their use is, as yet, limited as compared to that of the machine known as

used in connection with a track, it may be easily moved on or off the rails or held on an incline by a rope.

Two short lengths of hose form the only connection between pulsator and drill, giving a flexibility to the unit in striking contrast to the usual electrical type, involving a mechanical connection between these two elements. The air in the hose, which is simply a transmitter of power, forms an unbreakable cushion protecting the more vulnerable parts of the mechanism from shock, wear and breakage.

The drill proper is simply an air drill of the utmost simplicity, devoid of all the minor but essential accessories of the usual rock drill, and using the familiar shell and feedscrew. It is the simplest machine of its kind ever built—a plain cylinder containing a piston, mounted on a standard column, shaft bar, quarry bar or tripod.

COAL CUTTERS

Of the various coal cutters, the chain type is considered the most satisfactory and is in quite general use. The chain is driven by an electric motor and the whole mechanism is mounted on a truck. Through the electric drive it has been possible to make the machine entirely self-propelling, securing a movement from one side of the room to the other, thus completing the cutting in one operation. The cutter is also so arranged that the electric

power can be used for unloading, moving to position at the face, loading upon the truck and moving about the mine, making a large saving in time and labor over other designs.

While direct-current motors are generally used for driving coal cutters, alternating-current machines may also be successfully employed. Many important improvements have been made of late in the construction of coal-cutter motors, one of the most important being the gas-proof design which has been sanctioned with the Government's approval.

AUXILIARIES

Besides the previously mentioned applications, there are numerous others about a coal mine, in which electricity has played a most important part in improving the working conditions and increasing the output. Among these may be mentioned the various machines used in breakers and tipples, such as crushers, picking tables, screens, conveyors, etc. These are preferably driven by

induction motors, either connected to driving shafts or to individual machines. The absence of commutator troubles, which may be aggravated by the severe vibrations frequently encountered in this service, makes such motors preferable to those employing direct current.

The use of electricity for lighting, particularly its employment in the miner's cap lamp, and for signaling and telephone communication, is too well known to need any comment.

✂

Since a trolley wire serves the double purpose of a conductor and a feeder to the moving current collector, it must be of high conductivity, also strong and durable. Trolley wire is generally made of hard drawn copper in three shapes, round, grooved and figure 8. The latter form is not extensively used for two principal reasons. Owing to its unsymmetrical section, it is difficult to handle and to place in position. The nonuniformity in the sections as made by different manufacturers has rendered it impossible to make a uniform style of mechanical clamp for supporting the trolley wire. Trolley wires are seldom made larger than $\frac{1}{8}$ or smaller than $\frac{1}{16}$ B. & S. gage. They may, however, be made either larger or smaller than these sizes.

The Trapper

Written Expressly
for COAL AGE

By BERTON BRALEY

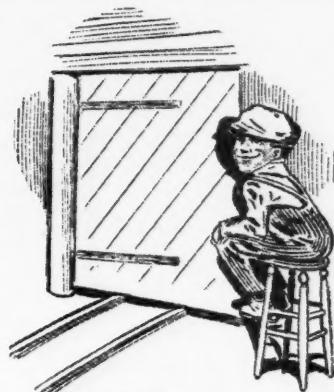
HE'S only a kid with a grimy face
Who sits by a door all day,
His job's not much of a fancy place,
He'll never get rich that way;
He's deep, deep down from the light and sun,
But he whistles with careless glee,
For the heart of a boy is full of fun
Wherever that boy may be.

*So here's to the happy trapper
Whose grin is a full yard wide;
He comes in a small sized wrapper,
But there's pretty good stuff inside!*

His cheek quite often contains a quid,
His language is not refined,
He isn't the Sunday School sort of kid
Not being that way inclined;
He can give and take in the miner's slang
And his wit is far from flat,



HE can Give
and Take
in the Miner's
Slang.



HIS Grin is a
Full Yard Wide.

And though he runs with a roughhouse gang,
He's a pretty good boy, at that!

*So here's to the snappy trapper
Whose impudent ways we know;
He comes in a small sized wrapper,
But give him a chance—he'll grow!*

He must "swing her wide" when he hears the roar
Of a mule train coming on,
Or the train may crash on the heavy door
And a first-class mule be gone;
He must watch his work with a careful eye
Lest the air in the rooms grow stale,
And firedamp gather and good men die,
And mothers and children wail.

*So here's to the humble trapper
And all of his youthful band;
He comes in a small sized wrapper,
But holds men's lives in his hand!*

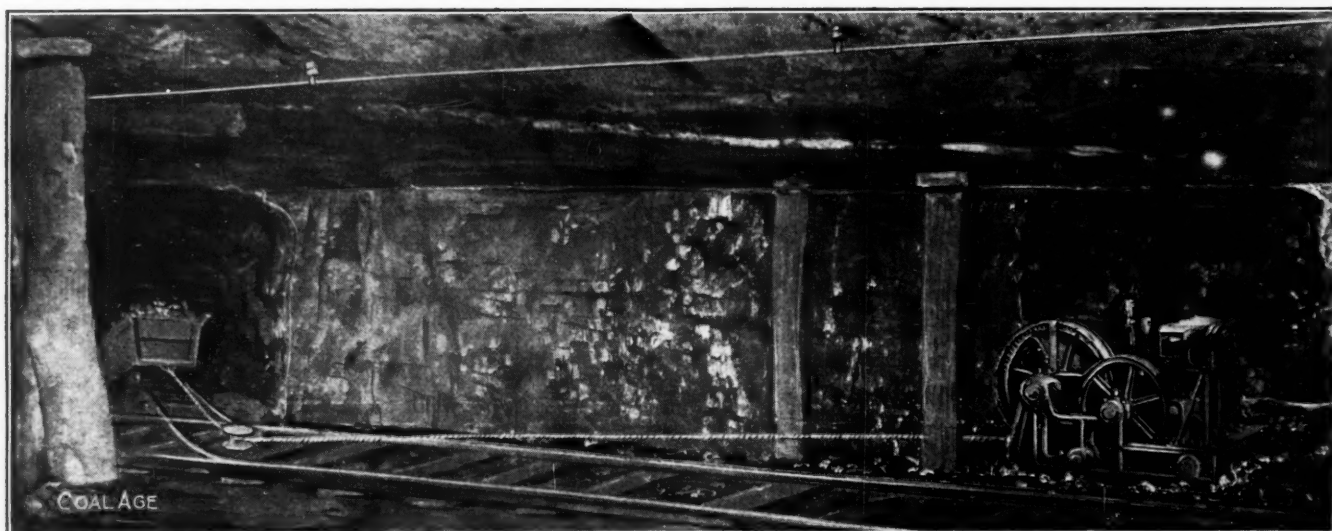
The Development of the Ebensburg Coal Co. Mines

By H. V. BROWN

SYNOPSIS—In order to hasten the advance of the mine entries, the headingmen at the Ebensburg mine both cut and load the coal in the haulageways and air courses, placing the cars for loading with the aid of a hoist whenever the grades would otherwise be prohibitive.

Modern progress in coal mining tends toward larger capacities, which must be obtained under conditions that are becoming more and more difficult. To produce large tonnages, especially in the thinner beds, it is vitally necessary that careful attention be given to the development

sider some reliable method of handling cars at the entry faces. Mules could not be considered, as the mine was electrically operated, and the management felt that it could not use gathering motors without materially retarding the advancement of the headings. It was apparent that a small electric hoist which was readily portable and could be made to serve a pair of headings and so simple that a miner could operate it would best meet the conditions, and the Pneumelectric room hoist was therefore adopted for use in all headings having a grade of over 3 per cent.



ROOM HOIST PULLING A LOADED CAR OUT OF A DIPPING BACK HEADING

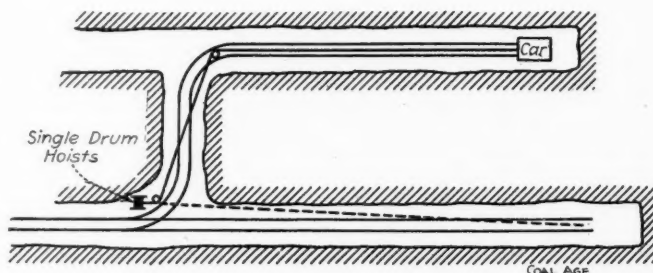
of the headings. No. 1 mine, of the Ebensburg Coal Co., at Colver, Penn., is a good example of a large capacity mine working a thin seam, and the methods employed in its heading development are worthy of note.

Development of the Ebensburg No. 1 mine was started in the early part of 1911, this work consisting of the general preliminaries, and the starting of the rock tunnel. About Apr. 1, 1911, coal was reached in the air shaft, also in a slope which was used for the initial development of the mine. Some of the first heading work was done by means of compressed air, which was furnished from a temporary plant. When the permanent power plant was completed in the early part of 1912, careful consideration was given to the problem of obtaining an electrically operated machine, especially suited for heading development work. The Pneumelectric electrically operated coal puncher was adopted for this purpose. The first unit was installed in April, 1912, and more were added from time to time, so that now 42 of these machines are used, practically all on development work. In this time the output of the mine has increased to an average capacity of four thousand tons per day.

TRANSFERRING CARS AT ENTRY FACE

As the mine progressed, local grades which were encountered on some of the headings made it necessary to con-

The main headings are driven 18 ft. wide, all other headings 10 to 15 ft. and other narrow work, such as crosscuts, etc., being driven 10 ft. wide. Four men are usually employed to drive a heading, its accompanying air course and the necessary crosscuts, and one electric puncher working on the cutting-and-loading system does the undercutting in these places. The machine is, of course, not in use continually, but is always instantly available when there is a place to be undercut. This system of driving headings is much superior to that in which the same machine undercuts in both rooms and headings.

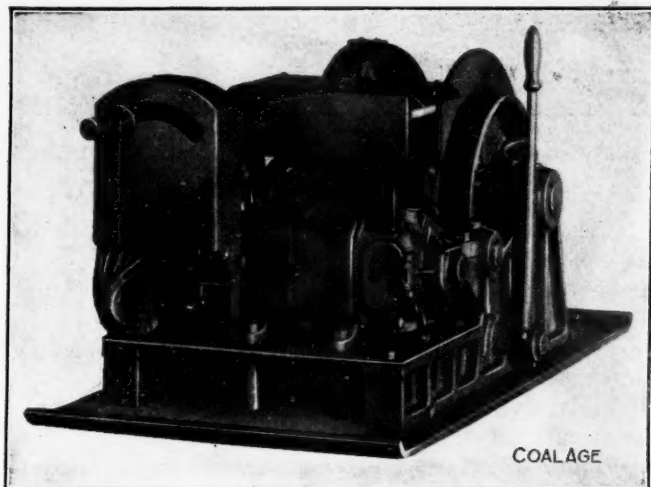


METHOD OF PULLING CARS FROM DIPPING FACES OF BOTH HAULAGEWAY AND AIRCOURSE BY A SINGLE HOIST

With such a plan there is almost always a considerable delay in undercutting the heading after it is "cleaned up," because the machine has many other places to serve, also because of blocked roadways and other causes of delay. Too often the result is that the headingmen leave their places, and thus the entry stands idle for that shift. No such delays are possible when the cutting-and-loading system is adopted. The accompanying illustration gives a good idea of the way the electric puncher does its work; one feature which is especially noteworthy being the character of undercut, which assures greatest safety in "shooting," uniform ribs and the best condition of roof, since the charges of explosive are light.

HOISTS OPERATED BY HEADINGMEN

The method of using the room hoist is illustrated by the accompanying sketch. The hoist is placed just outside the crosscut and, by means of spool sheaves set on the ties, the rope can be taken to the face in either the heading or air course. When necessary, the empty cars can, of course, be drawn to the face by means of a suitable sheave and jack set near the face. The miners operate these hoists and are thus enabled to take the trip of five or six empty cars, which the locomotive may leave, load them all, and have them back on the heading outside the crosscut ready for the next trip of the motor. Since the rope drum on these hoists holds over 500 ft. of rope, it is only necessary to move the machine and extend the trolley wire when the heading has advanced that distance.



ELECTRIC ROOM HOIST OR CAR PULLER

The advantages of this system of driving headings can be summed up briefly in the statement that the headingmen are never delayed by waiting, either for their places to be undercut or for their loaded cars to be shifted. The time of making the undercut is less, when all things are considered, than in the case of undercutting by pick or by any other type of machine. The net result therefore is that the miner is enabled to spend practically all his working time in shooting and loading the coal, and thus advancing the heading.

That this system works out well is best illustrated by the fact that the Pneumelectric coal punchers and hoists produced, last month, over 17,000 ft. of narrow work, this figure including headings, air courses and crosscuts, but making no allowance for room necks. Stating the figure in another manner, these machines have produced an



THE CONVERSION OF ELECTRIC ENERGY INTO ENERGY OF COMPRESSION, AND THEN INTO THE TRANSLATIVE ENERGY OF THE PICK PLUNGER IS PERFORMED WITHOUT THE INTRODUCTION OF ANY ELABORATE OR WEIGHTY MACHINERY

equivalent of over 6700 ft. of heading progress with accompanying air course, crosscuts, etc.

The writer of this article is indebted to T. R. Johns, general superintendent of the Ebensburg Coal Co., for the information forming the basis of this article.

✱

Extracts from a Superintendent's Diary

I have never found it possible to lay down a rigid rule of conduct for my own guidance covering the acceptance of gifts. I do not enjoy receiving presents of any kind from any source and never have. They all seem to belong to one of two classes; those given with affection and those given for affection. The givers of gifts that come under the first class can generally ill afford the gifts they make and often inconvenience themselves to a point of embarrassment as a consequence. The ones that come under the second class embarrass both the giver and the receiver eventually.

If it were possible to always determine positively before accepting a present to which class it belongs, it would at least be possible to avoid wounding sensitive hearts, and yet administer telling rebukes occasionally when circumstances demanded; but it is very often not possible to draw the line with any degree of certainty.

Some of our foreign-born citizens are among the worst offenders in the matter of trying to curry favor by means of gifts.

We have one such family in our camp in particular (they are Italians) that has persistently exhausted my patience. So long as their tactics were confined to the men folks of the family, I managed to make the proper allowances, but when the wife and the mother began to work on my wife, I became disgusted. Even at that they have the laugh on me for right now the father is working every day in our blacksmith shop, while two men who are more competent and really worthier are working two days a week, because of the slackness in business.

They began by sending over fruits for my younger children. They are related to an Italian in town who conducts a wholesale tropical fruit business and in conse-

quence they are always well supplied with rather choice fruits. My wife was at a loss to know just how to meet their advances. She did not want to offend them and ended up by doing nothing at all, hoping they would not repeat the occurrence, but they did repeat the incident time and again and gradually varied the gifts to include wines, cheese, etc.

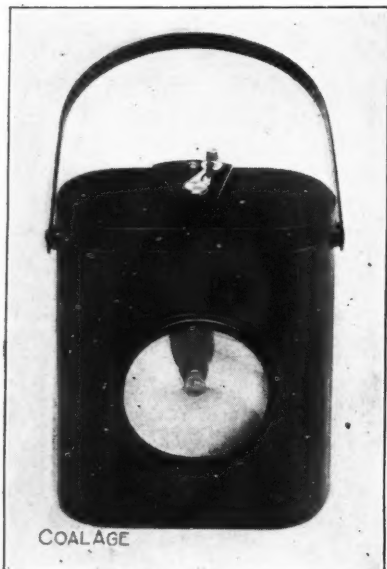
Then followed an exchange of confidences between the women folks and my wife learned that the family were living from hand to mouth, and they should never have thought of making presents out of their meager store. For three months now my wife has been drumming into my ears this family's affairs and when it became necessary to put some of the men on short time last week, fear of what my wife would surely say influenced my decision and I spared the Italian and swallowed my disgust.

Years ago, when I was a young fellow getting my first experience around mining camps, nearly every man in authority had some kind of a perquisite that went along with his regular salary, and as a matter of course the underbosses who were not so fortunate managed to tack on a few perquisites and did so without any stretching of their consciences. Back in those days my Italian and his family would have been general favorites, and a few fat years would have been sufficient to have enabled them to return to their native land. But now with the word perquisite almost an obsolete term, their future cannot be very rosy. Eventually I will be compelled to get rid of them and each move means for them the entire undoing of all of their carefully prepared plan of campaign, and a reduced fund with which to begin the new assault.

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A New Portable Electric Lamp

A novel form of portable electric lamp has recently been placed on the market by H. W. Johns-Manville Co., New York City. The particular feature of this lamp that



COAL AGE

A PORTABLE ELECTRIC LAMP

appeals to the user is the fact that two ordinary dry batteries are used to maintain the light. The advantage of this is apparent, since these dry cells can be procured quickly and readily at almost any point, when it is necessary to replenish the battery of the lamp.

The lamp consists, as shown in the accompanying illustration, of a light tin case, which holds the batteries. A small one-fifth ampere, 2½-volt, tungsten bulb is set in the center

of a 3-in., silver-plated reflector. A switch shown at the top of the lamp turns the current on or off, as desired. It is claimed that, with this reflector, the lamp projects a beam of light that renders objects clearly visible at a

distance of 100 ft. The two dry cells, it is stated, are sufficient to maintain the light for at least 100 hr.

The lamp is furnished with a handle by which it can be carried or swung on the arm. The weight of the lamp is chiefly the weight of the two dry cells, and is about 5 lb. This lamp is a convenient one for many purposes. It was originally designed for the farm; but has been found useful in coal mines in the pumproom, toolhouse and other shanties, as well as on the shaft bottom. For these purposes it is a very convenient form of portable electric lamp. The price of the lamp complete is \$3.50.

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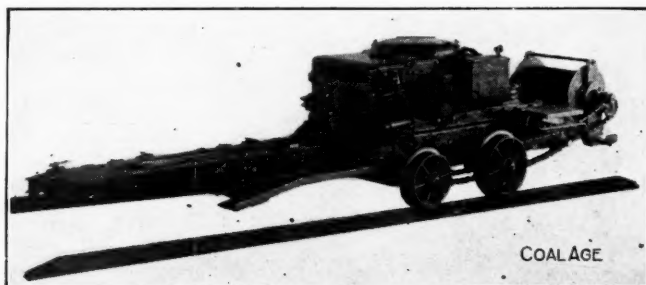
A New Tack in Undercutting Coal

By RALPH E. NOBLE*

SYNOPSIS—The possibilities involved in decreasing the width of the kerf made by coal undercutters of the chain type are here set forth.

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Ever since the introduction of successful chain mining machines, the standard kerfs cut have ranged from about 4½ to 6 in. in height.



COAL AGE

NARROW-KERF SHORTWALL MACHINE ON REVERSIBLE SELF-PROPELLING TRUCK

In the design of the machines in order to use the class of material available at that time for the chains, and frames carrying the same, it was felt that this amount of space was needed. Furthermore, this large kerf was in every way acceptable, since it was a material reduction compared with the undercuts made by punchers or by hand. In some mines the fine coal produced was not objectionable, for the cuttings were used, together with the balance of the output, in making coke or sold as run-of-mine.

However, in certain beds, where the whole profit depended on lump coal, strong objections were raised and efforts were made to cut in the clay or rock underneath the coal measure. Where this was free from grit and fairly soft, good results were obtained, but if hard and gritty, the small amount of undercutting done and the excessive wear on certain parts of the machine made the operation impracticable.

As the use of chain cutters became more general and spread to various fields, much attention had to be given to their development in order to meet the cutting conditions found and much larger and stronger machines were brought out to do the work required. In the anthracite fields, large motor equipments and stronger parts were considered necessary to cut the coal without excessive maintenance cost, and a number of such machines were

*Works manager, Morgan-Gardner Electric Co., Chicago, Ill.

produced and put into operation. These, however, still adhered to the large kerfs.

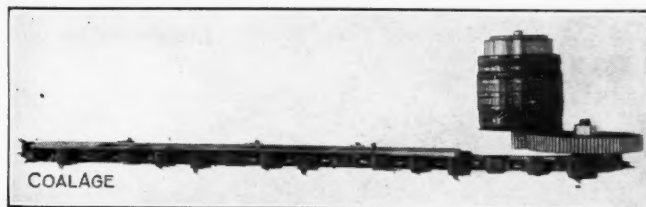
In certain beds there would be found several inches of free-cutting coal at the bottom of the measure, then a band of rock or sulphur, and then the principal coal stratum. If the kerf was put above the rock, too much bottom was left to take up by hand, while if it was cut in the bottom coal, the bits would hit the band and make the cutting difficult.

Since there has now been put upon the market strong alloy steels, better electrical and insulating materials, bearings, etc., the necessity for making large frames and chains no longer exists. Realizing this, a machine to cut a smaller kerf was developed.

Tests have shown that, at the same rate of feed, the power required is practically proportional to the height of kerf cut; i.e., a 5-in. kerf requires about one-fifth more power than a 4-in. kerf. This is a waste of power which should be avoided, not only for itself, but because the economy is accompanied by a reduced investment in copper for transmission lines.

After studying the problem, it was decided that the kerf could be reduced to $3\frac{1}{4}$ in., and machines were built for this size of cut. The benefits resulting are manifold,

such as lessening the duty and strains on the machine, which increases their life and reduces the upkeep cost; a direct saving in power, copper and bits; being able to cut in the bottom coal and avoid rock bands, sulphur balls, and places that would otherwise be troublesome, and a direct saving in coal, which amounts to a surprising sum in many localities.



NARROW-KERF CUTTER ARM, SHOWING SINGLE-REDUCTION GEAR DRIVE FOR CUTTING CHAIN

For example, a Morgan-Gardner 6-ft., type SA, short-wall mining machine, cutting 200 ft. of face in a day with a $3\frac{1}{4}$ -in. kerf, produces 13 tons of cuttings. If a 6-in. kerf is cut, 24 tons of cuttings would be made, showing a saving of 11 tons in large coal in favor of the $3\frac{1}{4}$ -in. kerf.

Meeting of Illinois Mining Institute

SPECIAL CORRESPONDENCE

SYNOPSIS—Discussions on the relative safety of continuous and alternating current, on the sealing off as against the ventilating of idle workings and on the value of panels for the prevention or the control of squeezes marked the successful winter meeting of the Illinois Mining Institute.

The second annual meeting of the Illinois Mining Institute was held in Springfield, Ill., on Nov. 19, 1914. Two sessions were held in the Council Chamber of the City Hall, one opening at 9:30 a.m. and the other at 2 p.m. In the evening a banquet was provided at the St. Nicholas Hotel.

The Illinois Mining Institute is open to "any person engaged or interested in any branch of mining," and it "has for its object the advancement of the mining industry in Illinois, by encouraging and promoting the study and investigation of mining problems, by encouraging education in practical and scientific mining, and by diffusing information in regard to mining that would be of a benefit to its members." Meetings are held twice each year, this being the fourth semiannual meeting.

ABOUT 50 PER CENT. OF MEMBERSHIP PRESENT

While the attendance was small, less than one hundred members being present out of a total membership of about 180, yet it was a thoroughly representative body of interested men, comprising operators, mine inspectors, representatives of mining-machine companies, educators, practical miners, etc. The keynote of the session was strict attention to business and a desire to make the day profitable to all present.

The meeting was called to order promptly at 9:30 by President Thomas Moses, superintendent of the Bunsen

Coal Co., who introduced the mayor of Springfield, John S. Schnepf. He delivered a cordial and brief address of welcome to the visitors.

In the absence of ex-President John P. Reese, general superintendent of the Superior Coal Co., who was to respond to the address of welcome, President Moses called upon W. C. Adams, electrical engineer of the Allen & Garcia Co., Chicago, to deliver his paper, entitled "Electrification of Coal Mines."

ELECTRIFICATION OF COAL MINES

Mr. Adams' paper covered the many lines to which electric power can be applied in and about coal mines, paying special attention to electric haulage.

A warm discussion followed the presentation of his paper. It was pointed out that the storage-battery locomotive does not require as large a plant for its operation as a trolley locomotive, there being a light load factor due to the charging on night shifts. In fact, owing to the great demand for power where storage-battery locomotives are being used at night, public-service power is well suited for such locomotives.

RELATIVE DANGER OF DIRECT AND ALTERNATING CURRENT

The question of the relative danger to men of alternating current and direct current was opened by Patrick Hogan, who stated that danger must be considered as well as efficiency, in deciding whether to use direct or alternating current. Two men were killed in his inspection district by the latter.

John Dunlop, ex-state mine inspector, referred to the deaths of two men from alternating current at the Brewster & Evans mine. These men were killed by the cur-

rent from a supposedly insulated wire. In case of an accident of this kind where alternating current is used, it is necessary to cut the wire or shut off the power before the victim can be freed, so strong is its grip on hands placed upon the conductor.

The discussion was finally closed by a motion that the chair appoint a committee of three to prepare a paper for presentation at the next meeting, on the relative danger of direct and alternating current in mines. It is hoped that by obtaining the joint opinion of three separate authorities, no one point of view will be given undue importance. The committee was not named before the meeting closed.

PANEL SYSTEM OF MINING

Mr. Reese, having come in during the discussion of Mr. Adams' paper, was called upon for a short speech, and when the paper of Patrick Hogan, state mine inspector, Third District, Canton, Ill., on the "Panel System of Mining" was read, Mr. Hogan brought out the following points as advantages of the panel over the usual room-and-pillar system:

1. The panel system offers the best facilities for ventilation, next to longwall.
2. Old and abandoned sections of a mine should be sealed and this is easier to accomplish where the panel system is in operation.
3. Gob fires should be closed off. Abandoned room-and-pillar workings, where the panel system was not used, cannot be sealed up, for there is too much to seal.
4. Squeezes cause trouble and expense. The panel system is not proof against them, but if panels are laid off carefully, a squeeze within a panel will not close the haulage road.
5. The haulage system has the main roads in solid coal. There is a concentration of work that gives big trips and a large output from a small territory.
6. Close supervision results from concentration in panels, also a saving in materials and a reduction in accidents.

HOW TO HANDLE GAS IN GOBS

In the discussion following this paper, objection was raised to sealing up large bodies of gas within a panel because of the risk of holing through when working the next set of rooms on the following panel. Of course, the new workings can be kept from approaching the old, but this entails leaving large bodies of coal as barriers between panels. Mr. Hogan thought that such pillars must be left intact indefinitely.

He stated that ventilating the old works would be best were that possible, but a large territory will have many holes due to falls of roof, and that large bodies of gas may accumulate in such places, as the air cannot enter them. Such bodies of gas are a menace to a mine. It may rush out when a roof fall occurs or a fall of the barometer may allow it to flow out or a windy shot may drive it to a point where it may be ignited. A sealed body of gas is not explosive because there is not enough oxygen present to provide combustion.

A GOB WHICH DEFIED VENTILATION

J. W. Starks instanced a case at No. 11 West Frankfort where the room-and-pillar system was in use. A bad top caused a squeeze that left some 10 to 15 acres in such a condition that it could not be ventilated and became

filled with gas. Concrete walls were built to close it in and stood for five or six years. A pipe leading from this area showed that the gas had finally been rendered harmless by blackdamp. The walls were blasted out and the workings laid out in panels. Mr. Starks recommends the sealing of such areas, seeing that it is impossible to ventilate them.

President Moses explained that he had to deal with some 30 to 40 ft. of soft shale above a coal, with a solid stratum above the shale. Large cavities were formed and these became filled with gas. A disaster would have resulted if the gas had been allowed to enter the working portions of the mine. Such gas, in any event, should be carried away from the men by a gas entry, regardless of whether the panel or room-and-pillar system is used. This is the practice in western Pennsylvania.

PANELS LIMIT BUT DO NOT PREVENT SQUEEZES

Mr. Reese stated that his company is operating large mines on the panel system. It does not prevent squeezes and his mines have had many which were the occasion of much expense. A total of at least twenty have occurred in two mines. None of these squeezes ever came over the haulageway. The squeezed panels are sealed off by two or four stoppings.

In his mines he finds that an extraction of 60 per cent. of the coal brings on squeezes, so only half of the whole seam is taken now in hope that this trouble can be avoided. Mr. Reese claims that at least as much coal can be extracted by the panel as by the room-and-pillar method, while the panel system has a great advantage in ventilation. But the haulage is more expensive in panel than in room-and-pillar workings, this being due to the long distance, nearly 1500 ft., over which a mule must haul coal while developing up to the first room in the panel.

NEW OFFICIALS ELECTED

The afternoon session was opened at 2 p.m. as a business meeting. Officers were elected for the coming year as follows:

President, J. W. Starks, state mine inspector, Fifth district, Georgetown, Ill.

First vice-president, W. M. Burton, Herrin, Ill.

Second vice-president, F. S. Phaller, Belleville, Ill.

Secretary and treasurer, Martin Bolt, chief clerk of the State Mining Board, Springfield, Ill. Mr. Bolt has held this position ever since the Institute was organized.

Executive Committee—John Dunlop, Peoria, Ill.; Patrick Hogan, Canton, Ill.; John Bohlander, Pekin, Ill.; John P. Reese, Gillespie, Ill.; J. S. Reid, Cartersville, Ill.

John Bohlander is president of the State Mining Board and Mr. Reid is state mine inspector of the 12th district.

It was decided to hold the next meeting at Danville, Ill., at the time fixed by the constitution, which is May, 1915.

Following the business meeting, a paper was read by R. M. Gambol, of the Hirsch Electric Mine Lamp Co., Philadelphia, Penn., on "The Advantage of the Electric Cap Lamp for Coal Miners." A number of questions were asked and answered concerning the details of the Hirsch cap lamp, and the session adjourned for the afternoon.

BANQUET

The banquet was held at the St. Nicholas Hotel at 8 p.m., with Thomas Moses as toastmaster and 49 members present. Patrick Hogan favored the party with a few songs. Short talks were made by John Bohlander, Prof. H. H. Stoek, of the University of Illinois, F. W. De Wolf, state geologist, Charley Kane, Martin Bolt, David Ross, and others.

A New Type of Electric Locomotive

BY FRANK H. KNEELAND

SYNOPSIS—*The basic principle of the induction motor applied to a locomotive produces a machine which is independent of grades and the adhesion of wheels to rails.*

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We are all accustomed to think of the electric motor as a machine for revolving a shaft. In this construction the elements of the rotor receive electrical energy and moving through space and time transform it into mechanical power. The construction is such that the parts travel in circular paths around the shaft of the motor. It is perfectly possible, however, to so construct and arrange the stationary and moving units of the ordinary motor as to get a motion in a straight line.

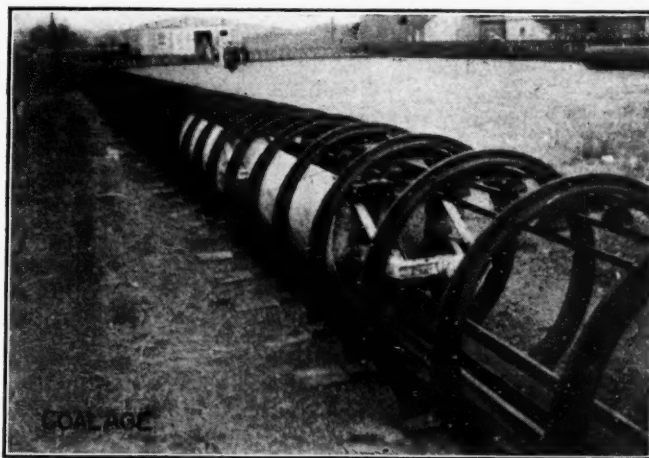
Take as an example the common induction motor with which all coal-mining men are familiar. Suppose that we cut the rotor and stator in two and straighten each element out, supporting them in proximity to each other, leaving the customary air gap between them but in such a manner that one is held stationary while the other is free to move in a straight line. Now should we pass the electric current for which the machine is wound through the device in the ordinary manner, a motion would be induced in the movable part relative to the stationary one. The speed of travel in this case would be exactly the same as the circumferential speed of the rotor in the ordinary motor.

Now to carry this idea a step further toward practical application, let us support the stationary element of the device between the rails of a track, and carry the moving element beneath the truck of a car traveling thereon, maintaining a suitable air gap at all times between these two elements. Now when both elements are suitably energized from a source of current supply we have an electric locomotive which is absolutely independent of grades and the friction between wheel and rail. This machine will travel along the track at a practically uniform and predetermined speed, regardless of grades, curves or other obstructions.

This is the fundamental idea which is embodied in the apparatus, the patents for which are controlled by the Electric Carrier Co., of No. 220 Broadway, New York City. This firm has constructed a demonstration plant at Paterson, N. J. This plant was built, however, with

the primary idea of demonstrating the possibilities of this method of transportation in the handling of mail or express matter underground in large cities, and consequently differs radically in detail from that which would be employed in coal mining.

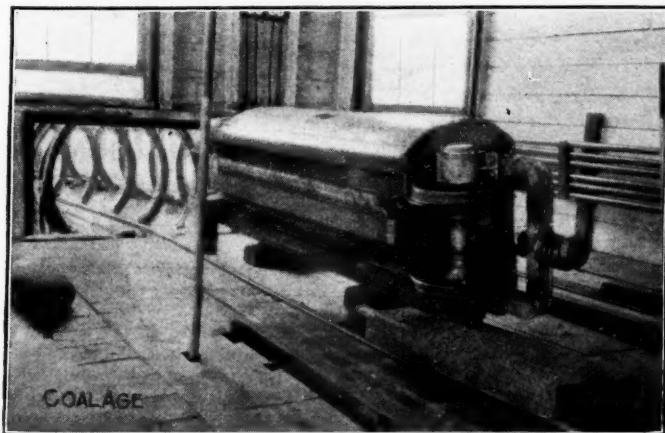
Two phases of the 100-volt, 55-cycle, 3-phase current are carried by overhead conductors which make contact



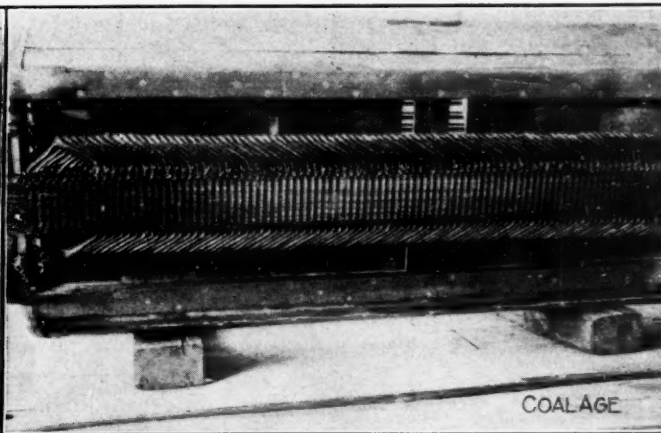
LOCOMOTIVE AND TRAILER ON DEMONSTRATION TRACK AT PATERSON, N. J.

with suitable shoes upon one end of the locomotive. The third phase is taken by the rails and the stationary element in the center of the track, which in this case correspond in general construction to the rotor of the induction motor. The moving element which is carried on the bottom of the car is equivalent to the field of the ordinary induction motor, and in this plant is composed of 12 poles. The wheels of the truck are, of course, practically independent of all electrical connections.

The lineal speed of the machine is uniform, or as nearly so as the revolutions per minute of the induction motor under load. This speed is determined by the pitch of the poles on the moving element and the frequency of alternations of the current. A reversal of one phase of the current reverses the direction of travel of the locomotive.



BOTTOM VIEW OF LOCOMOTIVE



NEARER VIEW OF LOCOMOTIVE WINDINGS

The air gaps maintained between the stationary and moving elements of the device may be varied between say $\frac{1}{8}$ and $\frac{1}{2}$ in., the only difference in operation being a difference in the power factor on the system.

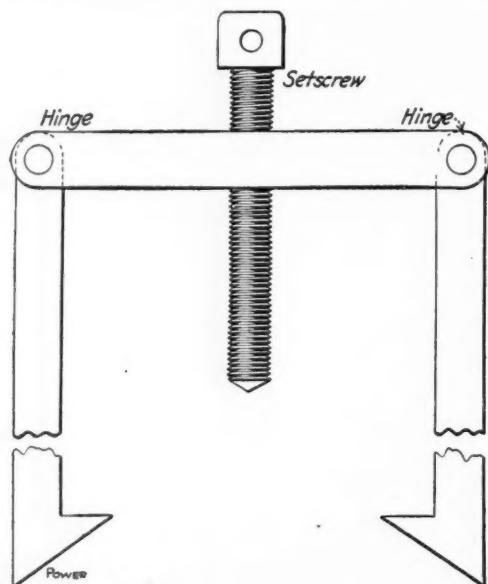
It will be at once evident that a system of this kind presents a wide range of possibility. On adverse grades or heavy curves the stationary, or track, element may be constructed with heavier copper, and the impressed voltage increased, thus augmenting the pull where such an increase is necessary. On favoring grades, where the speed of the locomotive and trip tends to increase, when a velocity 5 to 10 per cent. above synchronism is reached, current is generated and returned to the line. This on down grades offers a braking effect to the movement of the trip, which is practically ideal.

This system may be built to be operated either in the ordinary way with a motorman upon each locomotive, or each car may be run entirely automatically. The former would probably be the more preferable method in coal or metal mines, while the latter lends itself readily to the transportation of mail matter and express in cities.

As stated above, the operation of this device is independent absolutely of the friction between wheels and rails. As a result, loads may be successfully handled upon either favoring or adverse grades which would be utterly impossible for the ordinary mine locomotive. Inclinations of 20 to 30 per cent., or even higher, may be negotiated without the slightest difficulty, while on systems which have a general down grade favoring the load, a considerable amount of power may be generated and returned to the system, balancing that required to haul the empties back up the hill.

Clamp for Safety Valve

A clamp for a safety valve to prevent its opening when applying a hydrostatic test to a boiler is described by Wrightson in *Power* for Nov. 3 and shown in the accom-



ADJUSTABLE VALVE CLAMP

panying illustration. The clamp is placed over the valve, the arms hooked under the valve body and the setscrew set down on the spindle, preventing the disk from lifting. This saves the trouble of increasing the tension on the spring and resetting to the right pressure after the test.

COMING MEETINGS

The American Mining Congress' seventeenth annual session will be held at Phoenix, Ariz., Dec. 7, 8, 9, 10 and 11, 1914. J. F. Callbreath, secretary, Denver, Colo.

The Coal Mining Institute of America will hold its winter meeting Dec. 8 and 9, 1914, at the Fort Pitt Hotel, Pittsburgh, Penn. Charles L. Fay, secretary-treasurer, Wilkes-Barre, Penn.

The West Virginia Coal Mining Institute's winter meeting will be held at Huntington, W. Va., Dec. 9, 10 and 11, 1914. Prof. E. N. Zern, secretary-treasurer, Morgantown, W. Va.

The American Institute of Mining Engineers will hold its annual meeting in New York City, beginning Feb. 16, 1915. Bradley Stoughton, secretary, New York City.

Who Are "Brokers" under the War Tax Bill?

The provision of the War Tax Bill of Oct. 22, 1914, for levy of a \$20 tax on "commercial brokers," promises to raise controversies as to just who fall within that term, since the same question arose frequently under a similar provision in the War Tax Bill of 1898. Under the latter measure it was decided by the Commissioner of Internal Revenue that persons who were employed by a coal company to negotiate sales for it on a commission basis were not subject to tax as "brokers"; it appearing that they were regular employees. The ruling in this case conformed to other decisions of the Commissioner to the effect that a "commercial broker" was one who, without being an exclusive agent, made a business of negotiating sales or purchases for others on commission, without taking title or possession of the goods. Since there does not appear to be any good ground for reaching different conclusions under the present bill, it is a fair assumption that the same rulings will be made under it.

Itinerary of Bureau of Mines Rescue Cars

CAR NO. 8

Welch, W. Va.—Dec. 9 to Dec. 19.
Gary, W. Va.—Dec. 20 to Dec. 29.
Davy, W. Va.—Dec. 30 to Jan. 9, 1915.
Roderfield, W. Va.—Jan. 10 to Jan. 19.
Coalwood, W. Va.—Jan. 20 to Jan. 29.
Berwind, W. Va.—Jan. 30 to Feb. 9.
Panther, W. Va.—Feb. 10 to Feb. 18.
Glenalum, W. Va.—Feb. 19 to Feb. 28.
Thacker, W. Va.—Mar. 1 to Mar. 9.
Matewan, W. Va.—Mar. 10 to Mar. 19.
Williamson, W. Va.—Mar. 20 to Mar. 29.
Chattaroy, W. Va.—Mar. 30 to Apr. 9.

CAR NO. 6

Luzerne, Penn. (mail, Homer City, Penn.)—Nov. 30, 1914 to Jan. 23, 1915.

Erratum

The account of the Royalton Explosion published in our issue of Nov. 7, 1914, should have stated that the disaster occurred on Oct. 27 and not on Oct. 29.

If heat be developed in an electrical conductor faster than it can be dissipated from its surface by radiation and convection, the temperature will rise. The allowable rise in temperature is one of the limiting features of the current-carrying capacity of any conductor, since the rate at which heat will be dissipated will depend upon many conditions, such as the size and structure of the conductor, the kind and amount of insulation, if any, and the location with respect to other bodies. It is not possible to give any general definite rule for carrying capacity that will be true for all conditions.

Who's Who in Coal Mining

Everett Drennen

There is a young fellow down in Virginia who has accomplished quite a lot since he first became engaged in coal mining—about seven years ago. His name is Everett Drennen, and he first saw the light of day out in Minneapolis, about the year 1881. He's quite a bashful, backward sort of chap; so it is hard to understand just how he came to inject himself so violently and so deeply into the coal industry. However, he's there with both feet, and that's about all that counts in these days of dealing in actualities. Furthermore, we can't complain about



EVERETT DRENNEN

Everett's presence among us, for we are obliged to admit that the coal-mining business is all the better because of his activities.

After finishing the usual course of study in the public schools, Everett somehow or other managed to register himself as a student in the engineering department of the University of Michigan. Two years of study at the Ann Arbor institution satisfied him and he showed up next at Cornell—that far-famed knowledge factory situated midst the quiet scholastic atmosphere of lake and mountains in the central part of New York State. Just three years later he emerged from the classic halls of Cornell with a sheepskin credential tucked snugly under his arm.

Everett's first work was out in Ohio, where he spent a few months building roads for the Commissioners of Belmont County. However, this line of engineering did

not hold attraction for him, so when an opportunity presented itself in the coal fields of West Virginia, he was quick to accept the chance, and in October, 1907, we find him serving the Fairmont Coal Co. as superintendent of their power and mechanical departments. In this position he was in charge of all the electrical and mechanical equipment of 47 operating mines. It isn't necessary to dilate on the value of the experience he gained while holding this position; suffice it to say there can be no doubt concerning the quality of the service he rendered, for in 1909 he was advanced to the position of superintendent of the entire power and mechanical departments of the Consolidation Coal Co., having charge of this class of work in all the company's mines in Maryland, Pennsylvania, West Virginia and Kentucky.

While filling this last mentioned position, he also served as general manager of the Fairmont Mining Machinery Co., consulting engineer of the Monongahela Valley Traction Co. and managing director of the Black Diamond Products Co., all of Fairmont, W. Va.

From March, 1913, to June, 1914, Everett was actively engaged in managing the 14 mines of the Consolidation Coal Co. in the Elkhorn division, Jenkins, Ky. Other duties which he assumed at this time were vice-president and director of the First National Bank at Jenkins, director in the Bank of McRoberts, Fleming, Ky., president Sandy Valley Light & Power Co., director of the Prestonburg Light Co., director of the Paintsville Water & Light Co., and director of the Standard Tie & Mfg. Co.

In June of the present year, Mr. Drennen was appointed vice-president and general manager of the Stonega Coal & Coke Co. at Big Stone Gap, Va. This corporation is one of the largest producers of coal in this Virginia-Kentucky territory.

One of his most notable achievements was the construction of a 10,000-kw. steam-electric turbo-generator central power plant for the Consolidation Coal Co. at Jenkins, Ky. Other large central plants that were built under his supervision are at Hutchinson, W. Va., Van Lear, Ky., and Fairmont, W. Va. He also accomplished some notable results in the construction of two three-phase, 40,000-volt transmission circuits for the Consolidation Co. One of these lines was in Kentucky and is 40 miles long; the other line is in West Virginia and is 25 miles in length.

In 1911, while connected with the Consolidation Coal Co. at Fairmont, Everett conceived and developed the idea of the Jeffrey-Drennen turret mining machine. It was about this same time that he organized the Standard Tie & Mfg. Co., at Fairmont, which developed the well known Fairmont steel tie.

Mr. Drennen is a member of the American Institute of Mining Engineers; he is also a member of the West Virginia Coal Mining Institute and the Kentucky State Mining Institute. Few young men connected with the American coal industry have accomplished more, or advanced so rapidly to a position of such high trust, as Everett Drennen.

Editorials

The New Haven's Purchase of Canadian Coal

Announcement has been made that the New Haven R.R. has contracted one-half its annual requirements at Boston, or approximately 200,000 tons, with the interests that ship Provincial coal, and there is now a well defined rumor that the Boston & Maine has closed a similar contract for about 75,000 tons for delivery at the same point. These two items have occasioned a great deal of comment unfavorable to the new officials of the two railroads in question.

The New Haven deal is especially significant, and in the view of many is bound to be heard from in months to come. A great American railroad dependent for its earnings on the general prosperity of the country has placed a large contract with a foreign corporation operating mines in a foreign country. This would be bad enough by itself under ordinary conditions, but to do it at a time when the American coal trade is almost stagnant, when mines in West Virginia and Pennsylvania are shut down for lack of business, and American shippers are resorting to every known expedient to carry them over one of the softest markets they have experienced in years, is exasperating in the extreme.

Particularly is this so when it is remembered that the coal from Cape Breton Island cannot compare in heating value with any of our recognized grades; it is well known that the steadily increasing discrimination against fuels that are too high in ash or low in fusing temperature has resulted in a consistent restriction in the markets for these particular coals.

Portland and Boston are the only centers where Cape Breton coal is imported in any quantity, and in 1913 the entire tonnage received at Boston was only slightly over 265,000 tons, 40,000 tons less than in 1912, and less than 5½ per cent. of the total tonnage of bituminous received by water. In other words, the New Haven R.R. buys for half its Boston requirements a coal that practically no other steam-user feels he can afford; in addition to this it is buying foreign coal, which inevitably deprives the American mine worker, operator, railroad and vessel owner of their fair share of participation in an American contract. In fact, it affects even the market for supplies at the mines where the coal might originate.

There are some very pertinent questions that might be asked in this connection. For instance, the Cape Breton coal entered at Boston has been exclusively for one of the large gas-producing companies, under an old, and what has been understood to be, a long-term contract, and the gradual reduction in the shipments from Louisburg and Sidney was due to the larger tonnages received each year from West Virginia and apparently the same holding company controls both the mines and the gas company. This particular holding company is not only engaged in the mining of coal, but in the shipping, the transportation, and the sale of it.

The New England Coal & Coke Co., which sold the

Cape Breton coal to the New Haven, is controlled by the same interests that dominate the gas company, which has been practically the exclusive customer for Cape Breton coal in the Boston market. The president of both of these is a prominent and conspicuous member of the executive committee of the board of directors of the New Haven R.R. This savors strongly of "interlocking arrangements"; it certainly looks as if the New Haven director had been transacting business with himself in the person of the coal company and gas company president; and ordinary citizens are wondering if antitrust acts apply. This, we remember, is the "reform management" of the New Haven R.R.!

Careful consideration of the subject leads one to the inevitable conclusion that the New Haven's poor orphan, the Boston & Maine, is making up the difference between the 200,000 tons the New Haven bought and the 275,000 tons or so the gas company has usually taken. Did the gas company want to be relieved of an undesirable obligation? Is the New Haven once more to be the goat?

Presidential Conciliation Boards

On Sept. 5 the President sent, unsigned, to the operators of Colorado, a paper entitled "Draft of a Tentative Basis for the Adjustment of the Colorado Strike." With it was forwarded a letter signed by the President containing the following enigmatical statement.

Two representatives of the Government of the United States have been actively engaged in investigating the whole situation. . . . The result of their investigations and of their very thoughtful consideration has been the drafting of the inclosed "tentative basis for the adjustment" of the strike.

It seemed to us then that this paper while outwardly appearing to be approved by the conciliators, Davies and Fairley, was really written by the President. We wrote to Hywell Davies to ascertain the facts on Oct. 2, and up to the present no answer has been made except in the morning papers of Nov. 30, where we read under the President's signature, the following clearer statement of the events as they actually happened.

After long waiting, therefore, and the disappointment of many hopes, I ventured, after taking counsel with representatives of the government who had been on the field and made themselves thoroughly familiar with all the circumstances of the case, to propose a plan of temporary settlement.

So it is clear that the proposals, declared from end to end of the United States to be those of the conciliators were not theirs at all but were written and should have been signed by our absentee President. Apparently Davies and Fairley never reached an agreement or if they did, the President did not like it and prepared an independent paper.

But now another board of conciliation is proposed with three members. One is Seth Low, a man who will give the decisions of the commission some weight. He was mayor of Brooklyn, 1881-85, president of Columbia University, 1890-1901, mayor of Greater New York, 1902-03,

and delegate to the Hague Peace Conference, 1899. He is now trustee of the Carnegie Institute at Washington and president of the National Civic Federation. Moreover, he helped to settle the Anthracite Strike, being one of the conciliators named by President Roosevelt.

With him on the committee are two lesser lights, one of whom is Patrick Gilday, president of the second district of the United Mine Workers of America and resident of Morrisdale Mines, Clearfield Co., Penn. He is an agitator who has some merits. It is true he has been unable to make his followers in the second district keep their contracts but he has been in favor of a fining system which he trusted would make the miners keep their engagements.

The third man, Charles W. Mills, is being widely heralded as an operator and he is, in some measure, entitled to that distinction. We cannot say we know much about him, but we learn he is general superintendent of mines at Somerset, Penn., of which he is in part owner. These mines are small; one produced 45,757 tons and the other 2752 tons in 1912.

The larger mine is ventilated by a 7-ft. fan, the smaller by a furnace. No machines were used in the mine in the year 1912 and the power was all furnished by horses or mules. No permissible powder was used, and in the larger mine, the ventilation was not satisfactory to the inspector on the occasion of his last visit in 1912. In the smaller mine the ventilation was fair. While No. 1 mine had defective drainage in some headings, the drainage was good in No. 2 Mine.

One man was killed in 1912, which is equivalent to a loss of about 12 men per thousand or a fatal accident for less than 50,000 tons. The rate for the inspection district is about 2.8 men per thousand or a fatal accident for 334,089 tons. Of course, as only one accident occurred, no far-reaching conclusions should be drawn from the one fatality as has too often been done by the Pennsylvania Department of Mines.

This is all the information we can find about the operating appointee of the president except that he is a partner of the firm of Swayne & Mills, and that the mines in which he has interest and which we have just described are operated by the Climax Coal Co. He was appointed a conciliator in the Westinghouse strike last June and in the Kanawha, W. Va., strike.

By looking back to our files of July 4, 1914, the reader may see that both Gilday and Mills reported in favor of the checkoff, if they can be said to have come to any conclusion at all because they offered the miners a choice between alternatives, one of which proposed the formation of another commission to do what Gilday and Mills had avoided doing, though appointed for that purpose. They sidestepped the issue apparently as gracefully as that other partnership, Davies and Fairley, which has now been removed to make place for Low, Gilday and Mills.

We have not chosen to point to the report of the Climax Coal Co. out of any malice. The important matter to the public and Colorado is that a man has been chosen whose mines have, perhaps by chance, been shown not to be up-to-date or leaders in safety. Charles W. Mills may be a most estimable and capable man, but we think it would have been well in view of the clamor which has willfully dubbed the operations of Colorado as being unsafe and inefficient, to have put an operator in the

conciliation board who would have been able to point to his own mines as an evidence of what might be done by wise counsels and due care. That judge is indeed in an unfortunate predicament when the man who appears before his bar has a clearer record than his own.

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A Welfare Association

Some time ago, May 23 of this year, we wrote an editorial entitled, "A Trust in Virtue." Such a trust we see has been started in Colorado. We hope it will be found in every coal-mining state of America and will be imitated by the unions.

The United Mine Workers of America make much sport of this new movement in the editorial columns of their journal. They say it shows that the laws have been violated. It does truly show that some of the operators, like some of the miners, are crooked. If the miners would spend the same time, energy and money in rooting out these people as the new association purposes to do, it would throw a bright halo over unionism. Then violence, dishonesty, violation of contracts and needless agitation would pass as a dream.

The miners can do it, and if we thought the United Mine Workers of America or any other body had half the virtuous determination of this new body known as "The Coal Mines Welfare Association," we would herald the renovated union as a new ray of hope in a sadly perverse world.

Here are the words showing the purposes of the organization. It is intended to "promote the welfare and safety of the employees of the members, to assist in the enforcement of all laws pertaining to coal mining, and to promote the accurate weighing of coal on the basis of which the miners are paid."

Let us quote what we said before on this matter because we believe it shows what the new association can and will do.

It is necessary, therefore, that there should be a strong attempt among all right-thinking, right-acting corporations to bear on all those who use their men wrongfully and who do not seek safety in operation.

There are several ways in which a union of operators, a trust of virtue, could be formed, which would make everyone, operator, miner and public, better satisfied. The agreement of the operators is made as a result of their combined effort; but never do those same coal-mine operators join hand in hand to force all the members of the organization to keep the agreement to the letter.

We would urge that all the associations of operators use their coercion not only on their employees, but on themselves, to the end that the agreements made shall be kept to the letter, and to so modify those agreements that unsanitary and unsafe conditions in camps and mines may not be possible.

Let us request the United Mine Workers of America to formulate a similar program and hold meetings for the purpose. It is time that that organization also spent some energy in house-cleaning instead of devoting its time and efforts wholly in correcting the faults of others. Like many people with much work undone and needing doing, it persists in reading the Golden Rule to others and neglecting its observance itself.

The men in control of the new operators' organization are as follows:

Incorporators—John M. Osgood, president of the Victor-American Fuel Co.; S. M. Perry and C. L. Baum. Directors—George C. Manly, C. L. Baum, S. M. Perry, G. F. Bartlett, D. W. Brown, president of the Rocky Mountain Fuel Co.; J. F. Welborn, president of the Colorado Fuel & Iron Co.; S. S. Murphy, George D. Kimball and D. M. Harrington.

Sociological Department

A Plea for the West Virginia Miner

BY MARGARET WALKER JORDAN*

SYNOPSIS—The writer, a settlement worker who has had experience in various lines of work, pays a visit to the "Winding Gulf" section in West Virginia and gives a description of her trip, explaining the needs of the mountaineer miners.

In the course of my studies at Columbia University, I heard much of Ellis Island, that door of hope to the yearly increasing multitude of immigrants, and much concerning the obligations which we owe to these our foreign brothers.

Ellis Island, however, is not the only place that challenges our sense of duty to our fellowman. Being a native of the Southern Alleghany mountains, where the purest

seems to know him. Little thought had been given to his welfare and uplift, until a strike followed by bloodshed brought him prominently to attention. Then the declaration of martial law in West Virginia, followed later by the memorable occurrence in Colorado, which now occupies so much of our attention, made the miner, his life, conditions and surroundings the topic of the hour. The world generally does not know of these people, and what is more, few people have seemed to care to investigate.

I was particularly fortunate in getting my information first hand in the field itself. My sense of fair play was aroused by the false opinions and unjust criticisms of people who know nothing of the actual situation in these mining communities. I realized that the only way to learn and know conditions is to *live* in them. Therefore, with the twofold object of both learning and improving their methods of life, I went into several of the typical mining towns. I took with me two special teachers in home-



BOYS OF THE KING ARTHUR CLUB

These boys cleaned up that part of "Winding Gulf" which flows through the mining village of Tams

Anglo-Saxon blood of the world is found, and where in recent years, with the opening of vast coal operations, communities have suddenly sprung up with their attendant chain of serious problems, both social and economic, I am naturally strikingly impressed with a sense of duty to our brother in that section, and I have been wondering what we are doing to uplift him.

THE MOUNTAINEER'S NEW ENVIRONMENT

The man who makes up the mining population of the West Virginia camps is of a type which for generations had been isolated in the mountains, where hunting wild game and chopping timber "offen his patch" were the only sources of livelihood. But today his patch is no more. An absentee owner cut the timber from the whole range and sent the mountaineer with pick and shovel under the surface to dig coal.

Literally buried from sight of sun and progress, no one



BRIGHT LITTLE FOREIGN YOUNGSTERS

The girl with the child speaks five distinct languages, and with all the others should make the best type of a citizen

making with a view of securing the confidence and interest of parents through effective work with the children.

The coal operators were favorably inclined toward the experiment. Owing to my inexperience, I could outline the work only vaguely in the beginning. But from the day of our arrival, we aimed to bring something of happiness, contentment and economy into the homes of the community. We saw at once that the situation would demand tact, patience and, above all else, no outward affiliation with the company itself, for the operator as an operator is sincerely hated.

SOCIAL EXPERIMENT ON "WINDING GULF"

The place we chose for the beginning of our work was on a branch of the Virginian R.R. known as the "Winding Gulf." Four years ago it was virgin forest, but now little mining towns have sprung up like mushrooms all along the steep, denuded mountain sides. We were to work in a series of three of these towns, strung along the "Gulf" about two miles apart.

*No. 4406 Walnut St., Philadelphia, Penn.

Thus it was that on a hot August day, three university girls found themselves in a dirty little street of a dirty little town, surrounded by dirty little children and grunting pigs. The question of at least temporary accommodation was soon solved. We approached the one building which was somewhat more pretentious in size than its neighbors. We assumed the role of teachers and began to organize sewing and kindergarten classes. In this way we finally got started, though at first we had considerable trouble.

THE MEN MORE APPROACHABLE THAN THE WOMEN

Our calls on the neighbors began immediately. Most of the faces were unsmiling and stern, but they showed us the hospitality of "have a totter stranger." One dear woman wished us "succession;" another showed us her photographs. One man proudly brought out the gun and hound which he had received in exchange for his last wife. We became acquainted and our room on the third floor of the boarding house became a classroom. Boys up to 30 years old came to that "kindergard" school.

With their help we cleared the space for a playground. Their fathers moved the heavy timber left by the lumbermen and built swings. Later, this cleared space was used not only by the children, but as an assembly room for evening socials and outdoor classes. This work in the other two towns was carried on along similar lines and always with patience and with almost immediate interest and enthusiasm on the part of the children.

With the women we were not so successful. A coal town is of necessity dirty. Water must be carried and housework is not systematized. Pay-day was announced every two weeks by the drinking of whisky, playing of cards and the flourishing of pistols. On these occasions, we kept a nightly watch, sitting on the edge of our wire cots very close to our thin, lockless door. The hours never dragged at such times, for our men folks liked a good time. These little amusements made our lives interesting, and at times exciting. Besides, the condition of the food and the wretchedness of the sanitation offered little to make living pleasant. Accordingly, we were glad to find in the next town a fairly comfortable four-room house.

The valley consists of a creek with a railroad on both sides. The mountains rise almost perpendicularly; the sun beats fiercely down at noon and in the evening drops quickly behind the mountains. Often while walking home from work along the lonely stretches of the valley in the somber dusk we, with faces blanched with fear, would pass negroes or Italians. At such times we would bolster up courage by humming a tune, the favorite being "I've been working on the railroad." But no matter whom we met, the "howdy" was always passed and the hats would invariably come off. In time, we became known by such names as "Mrs. Teachers Nice" or "Quality Ladies." The distances we had to cover took much of our time and energy. This gave us much concern, for we saw an ever

increasing number of things to do, but we realized our time and strength were limited.

Even Providence itself seemed at times to be allied with other forces in trying our mettle, for we continually worked under great difficulties, and it was only our ability to see the amusing side that often saved the situation.

DIFFICULTIES IN OVERCOMING CONSERVATISM

In one town the building which we expected to use was not completed; an available schoolhouse was too small; another school was closed on account of diphtheria. In that same town, a well equipped building which was offered to us burned. Drizzling fall rains and the earliest snows for "well nigh forty years" made walking bad and a playground impossible. In addition to these handicaps, there was marked opposition from local mountain teachers and school boards who had never heard of manual training, domestic art or science.

Naturally, then, we were forced, on account of this op-



ONE OF THE MANY SEVENTEEN-YEAR-OLD MOTHERS



SCHOOLHOUSE "STEPS" IN WEST VIRGINIA

position, to confine ourselves to evening club work. We taught something, of course, and sowed the seed for effective future work, but we learned much more than we ever taught, and undoubtedly received more than we gave.

We were forced to admire the conservatism and shrewd native ability of the mountaineer. We saw at once that knowledge for him must be simple, definite and shorn of all artificialities. The domestic science of a white marble kitchen left me somewhat at sea when I found myself equipped with nothing but a "two-eyed coal stove" and a frying pan. I didn't give up, for I realized that much is spent unwisely in equipment and that the problem of more wholesome and attractive food and greater efficiency and economy in cooking were to play a vitally important part in the ultimate success of the work which I had undertaken.

At this stage I realized that I was fortunate in having the cooperation of Mrs. Hanna B. Scott, of Philadelphia, whose 40 years of experience in teaching the wage-earner better and more economical cooking and homemaking, have made her recognized as an expert authority in this

important work. The interest which her remarkable demonstrations aroused in the community among men as well as women, employers as well as employees, gave me a new light and inspiration on the great ultimate possibilities of such work in a field like this.

THE LACK OF AMBITIONS AND DESIRES

Before anything can be taught, even to children, the desire to *want* must first be instilled. We want because our neighbors *have*, but in this community, lacking the education of environment, even that of the newspapers and department store windows, there is little to want. Your neighbor lives as you do. Life down there is a very simple, very elemental process. The people talk little, and they have gradually become like the mountains that surround them, reserved, conservative, showing neither pain nor pleasure, suspicious of all strangers and anything or anybody connected with the company.

Socialism there becomes violent anarchy. No demands are made by union leaders for better schools, hygiene or sanitation, but always for an increase in wage. Neither the man nor his wife knows how to make a dollar do



LOOKING FROM THE SCHOOLHOUSE UP THE GULF.
SOME OF THE CITIZENS OF TAMS

a dollar's work. The wage increase goes for gambling and cheap whisky. One even sees a native driving mules on Monday morning in six-dollar patent-leather shoes which were purchased Saturday evening. The best grade of foodstuffs is demanded, and much of it ruined in the preparation or thrown out the back door. This extravagance is responsible for a large part of the discontent. It is the old, old story of "the high cost of ignorance."

The only hope for the situation is education. These people must be brought back to the simple, sensible way of living and be shown that work is a blessing, not a curse. We must teach mothers how to prepare wholesome, economical food. The task is a difficult one, requiring money, ability, skill and patience. But it can and will be started and accomplished when Capital realizes its importance and possibility.

THE LABOR PROBLEM AT MINES SIMILAR TO THAT ELSEWHERE

The coal operator, as any other business man, must see a profit for his investment. He is neither a philanthro-

pist nor a missionary. His position differs from that of the New England mill owner in that he does not create the present conditions under which he works. When people in the city talk of those terrible mines, I wonder if they know of their own department stores, which are supposedly model, and the factory and child-labor laws, which should be enforced. Maids in their own kitchens may be finishing 10- or 12-hr. days. The whole thing seems to resolve itself to this, that we are often conscious of the evils of the labor question in the distance, but not in our own home and environment.

When the ambition of the mountaineer is aroused, he seldom goes back. It is true that we were never quite sure just how our work was received, and because there was no outspoken appreciation we could not tell what lasting impression we had made. Some time after leaving, however, I wrote the girls' club about some work I was doing in one of the paper-box factories in the North, and in a few days I received a large, soft package, which contained hundreds of short-stemmed mountain violets, tied into small bunches with calico strings. The note accompanying them read: "You showed us as how they were pretty, and we reckon the girls up there don't have none."

The whole problem, after all, is teaching the laborer how to live. Simple, wholesome food makes a man better physically and mentally. A warped mind and soul may be the direct result of food and home surroundings, and corporations today are beginning to realize that the efficiency of a plant depends not only upon the latest improved mechanical inventions, but upon the food and care of the man who works in that plant.

To summarize what I have said, my object has been to outline conditions as they exist in the West Virginia and other mining towns, to tell what we tried to do to help the people there, and to make an appeal, as far as it is expedient, for improving conditions in the future.

✱

The Gillespie Meet

An open meet for all teams in the state of Illinois will be held at Gillespie, Ill., on Dec. 8, under the united auspices of the American Mine Safety Association, Local Union No. 730 of Mine No. 1 and the Superior Coal Co. Headquarters will be at the Colonial Theater, Gillespie, Ill.

At 9 a.m. the mayor of Gillespie will make his address of welcome and James Boston will respond. At 9:30, the one-man events will be held. Two-man contests commence at 1 p.m. At 2 p.m. the schoolboys exhibit their proficiency and at 2:15 the team events are contested. At 7 p.m. prizes are awarded and following this event prominent men in the community will address the assembled crowd.

In the evening at 8:30, moving pictures will be exhibited showing safe methods of mining coal, these exhibits being made by the Federal Bureau of Mines. The list of prizes seems as if chosen by the Society for the Prevention of Useless Giving for most of the awards are useful articles and money.

✱

The Golden Rule of First Aid Work consists of attending to accidents on the spot; stopping all bleeding by pressure; covering all wounds at once; preventing all unnecessary movement; keeping the patient warm; providing easy methods of removal; avoiding unnecessary interference and being yourself gentle, quick and cool.

Discussion By Readers

An Electric Mine-Haulage Problem

Letter No. 1—In the issue of COAL AGE, Oct. 24, p. 686, Fred Vinton asks the following question:

Why will an electric mine locomotive pull more on series than on parallel? For example, should a motor stall on account of defective bonding when running on parallel, it will at once start and haul the trip if thrown over on series.

The answer given takes up in detail many interesting questions concerning motor losses, but, I believe, misses the point that Mr. Vinton intended to bring out. The reasons given in the last paragraph of this answer are hardly sufficient to produce the result noted by Mr. Vinton. It will be noticed that the question asked ascribes the trouble that caused the motor to "stall" to "defective bonding."

I want to suggest that the proper answer to this question is that the high resistance in the circuit, due to the defective bonding, causes practically the same current to flow through the locomotive whether the motors are in series or in parallel. When the motors are in parallel, this current is equally divided between the two motors and each exerts a torque corresponding to one-half of the total current taken by the locomotive; but when the motors are in series, the total current flows through each motor, causing a corresponding torque very much greater than was obtained when the motors were in parallel.

The following example will bring out the facts a little more clearly. Assume that we have a 10-ton locomotive equipped with two 50-hp. motors, hauling a load of 20 cars up a 1-per-cent. grade, each car weighing 3 tons when loaded. Now, taking the frictional resistance of the cars as 30 lb. per ton, the tractive effort necessary to haul this trip up a 1-per-cent. grade at a constant speed, will be 3000 lb. The locomotive has a frictional resistance of, say, 20 lb. per ton, which makes the tractive effort necessary to operate the locomotive on this grade 400 lb. The total tractive effort required to operate the entire trip, including locomotive and cars, will be therefore 3400 lb.

Assume that the defective bonding makes the total resistance of trolley and track 1 ohm; the total resistance of a 50-hp., series motor will be about 0.16 ohm. The resistance of the two motors in parallel will be one-half of this amount, or 0.08 ohm, and in series 0.32 ohm. With the motors in parallel, the total resistance in circuit would be 1.08 ohms, which, at 250 volts, would produce a current of 231 amp.; and the motors being in parallel, each motor will then take one-half the current, or 115 amp. From the tractive effort curve of the motor, it will probably be found that this current will produce a tractive effort of 1300 lb., so that the total tractive effort for both motors will be 2600 lb., under the assumed conditions.

On the other hand, with the motors in series, the total resistance of the circuit will be 1.32 ohms, which at 250 volts, would produce a current of 190 amp. This cur-

rent passes through both motors and, from the tractive-effort curve of the motor, will give a tractive effort of 2600 lb., which makes the total tractive effort, for both motors, 5200 lb.

Now, the total tractive effort necessary to operate the trip is 3400 lb. With the motors in parallel, the locomotive can exert only a 2600-lb. pull, which is insufficient to start the trip. But, in series, the total tractive effort, which is then 5200 lb., gives an ample margin to start the trip.

GRAHAM BRIGHT, Engineer,
Westinghouse Electric & Mfg. Co.

East Pittsburgh, Penn.

Letter No. 2—Referring to the inquiry of Fred Vinton, of the Penn-Mary Coal Co., asking why an electric mine locomotive will pull more on series than on parallel, COAL AGE, Oct. 24, p. 686, I desire to add a few comments.

In your explanation of the circumstance mentioned by Mr. Vinton, you endeavor to show how the motors in the locomotive operate when in series and in parallel, and make the statement that "the tractive force or drawbar pull of the locomotive depends as much on the adhesion of the wheels to the rails as on the power exerted by the motor itself." This would indicate that you regard the *tractive force* and *drawbar pull* as one and the same thing. Is it not true that the tractive force may exceed the drawbar pull of the locomotive?

Your statement is equivalent to saying that a mine locomotive will exert a drawbar pull that is limited by the adhesion of the wheels to the rails, and is not measured by the power exerted by the motor itself.

[It is proper to make a distinction between the **tractive effort** of a locomotive, which depends on the power of the motors; and the "tractive force," which, as stated, is limited by the adhesion of the wheels to the rails, as determined by the weight of the locomotive and the coefficient of friction. It is always possible that the "effort" to exert force is less than the force exerted.—Editor.]

After explaining that, in a direct-connected motor, the torque varies practically with the speed, except for certain losses to which reference was previously made; and, further, that the torque is practically independent of the voltage, the statement is made that "by reason of this condition, motors operated in series present a slight advantage in respect to torque, which measures the *tractive effort* of the locomotive." From this statement, it would appear that the case is viewed entirely from the efficiency of the motors, neglecting the *weight* of the locomotive.

[Again, permit us to say, the "tractive effort" that the motors can exert should not be confused with the "tractive force," which is limited by the adhesion of the wheels to the rails as well as by the possible torque of the motors; while the drawbar pull must be determined by the load hauled.—Editor.]

In this connection, permit me to state that, ten years ago, the Baldwin-Westinghouse Co. frequently equipped a locomotive with a series-parallel controller. It worked with fair success, because the horsepower, per ton of weight on the driving wheels, was so small that a loco-

motive of six or seven horsepower per ton when operating in series would hardly slip its wheels. Today, when electric locomotives, made by the Baldwin-Westinghouse companies, are sold to mines, they are equipped with motors ranging from 12 to 14 hp. per ton and are seldom, if ever, constructed with a series-parallel controller (rheostatic, with commutating switch).

The reason for this is that if you attempt to start a full-load trip, in series, the locomotive will stand still and slip its front wheels continuously, while the rear wheels will not move at all. If, then, the commutating switch be thrown into parallel position, the locomotive will start off with a jerk and frequently break a coupling. The result is that series-parallel controllers are not used on up-to-date mine locomotives; and the only reason why the one in operation at Penn-Mary mine will start and haul its trip over the defective bonding, is because the horsepower of the motors, per ton of weight on the driving wheels, is low; and because when operating at about 120 volts, the rails and defective bonds can carry away the current from the return. In addition to this, a well made series-parallel controller of the General Electric or Westinghouse companies is usually too high for mine service if used on a powerful locomotive. In mine work, while theory is useful, it is of small value as compared with practical experience in securing the output required under all conditions.

G. W. HAMILTON, Mining Engineer,
Milwaukee Locomotive Mfg. Co.

Chicago, Ill.

Merging the Interests of Coal Exporters

Letter No. 1—I have read with much interest the suggestions in regard to merging the interests of exporters of coal, which appeared in COAL AGE, Nov. 21, p. 820. At your request, though I must acknowledge it is with some diffidence, I will offer a brief criticism of the paper. I submit these comments for what they may be worth.

The suggestion appears to be that coal operators, instead of employing individual representatives, should jointly engage one or more representatives to act for the common weal.

Bearing in mind, then, that the constituent members of such an association are, when at home, in active competition with each other, it would seem that the success of such an arrangement will depend, *prima facie*, upon the assurance to each member that he would receive fair and equal treatment, and that no one else would get the "thick end of the stick." In other words, competition should be eliminated, as far as regards exports. This, however, would have a tendency to prevent the more important operators from joining the association, as they are unaccustomed and unwilling to be placed on the same footing with smaller operations. But, assuming that the association is formed, I am afraid it would fail in its purpose, for a reason similar to that given for the failure of the New River scheme; namely, "*internal disagreements*."

I have seen ideas of this nature attempted at various times, but they have never come to anything; and I think you may take it for granted that each seller will consider it more satisfactory to retain his individual agent, and conduct his business without reference to or inter-

ference by anyone else, than to enter any joint agreement with his competitors.

As to the 12 advantages claimed, I am not very clear whether these claims are most on behalf of the suggestion offered or of the coal-export trade. If the latter, most of the claims would apply; except only if No. 11 is read in conjunction with No. 4 the effect would be to the contrary. Increased exports and the consequent increased demand for ships, *unless accompanied by an increase of imports from the same locality*, would, of course, have a tendency to raise ocean freight rates. Claims Nos. 2 and 6 I expect are made solely on behalf of the suggestion, as possessing advantages over the usual method of selling coal. Claim No. 12 I do not quite understand. I would ask, "more easily handled" than what?

In closing, the correspondent says he "will not go into details of such a plan." In this he is right, as it would be for the members to determine these; but it is on the details that the whole proposition will depend, and no operator could give an opinion on its merits until a *pro forma* proposal is laid before him.

New York City.

GEORGE BREFFIT.

The Ohio Situation

Letter No. 4—George N. Lantz, COAL AGE, Nov. 28, p. 877, has made a clever reply to the editorial of Oct. 17, p. 637, entitled "Small Potatoes." He has declared that when men come into the market to buy labor they must pay the price regardless of the value of the products that the laborer is able to produce in a given amount of time.

As a matter of fact, this is not true: (1) Because no employer enters the labor market without some idea of what profit he can make by the purchase of labor. He may make an erroneous estimate, but if he cannot make a profit, he either ceases to employ labor or makes a new contract. (2) Because the laborer is often wedded to a certain locality, job or mine; or bound to a certain spot by his investments; or too poor to move; or too ill-acquainted with conditions elsewhere to pack up and leave; or too lacking in enterprise. Labor is by no means a mobile commodity, even in mining and in America, and it is notorious that wages vary considerably in different districts. Consequently wages are largely determined by the value of the product of labor as the editorial writer stated. Mr. Lantz, in urging that eastern Ohio operators could pay better wages if they would use better mining methods, quotes Supt. J. D. Jones, writing on "The Foreigner in Mining," COAL AGE, Oct. 17, p. 643, where he states that "Many coal-mine operators have been so engrossed in their sales department and other matters that they have given no attention to the introduction of mining machines and other improvements."

Now, it is not true that Ohio is backward in the use of mining machines, though possibly the type in use may not be the most modern. For years, Ohio has led in the percentage of coal mined mechanically. In 1913, the U. S. Geological Survey placed the percentage of machine-mined coal of Ohio as *first* among the American states, no less than 90.2 per cent. of the coal being dug by machines. The retrogressiveness does not lie so much in that direction, and the editorial does not so state, though it is true that improvements in equipment other than undermining are needed, as also doubtless some better machines than those now in use. But not even that was

asserted in the editorial. Let me quote the words as they appeared: "The wage scale of Ohio has made the state backward in conservation, negligent of first-aid, indifferent as to housing and largely unprogressive." There is not a word written there as to mechanical equipment.

Mr. Lantz seems to think that the Ohio operators should risk their money in experiments in welfare work, and so escape the desperate straits thrust upon them by those whom the welfare work would benefit. Welfare work may "pay," it is true, but who will be willing to risk it when each year now sees a deficit?

The eastern Ohio operators evidently did not believe, in 1913, that conservation, first-aid and good housing would enable them to make a profit, or they would have embarked with much energy in these projects. Why increase their difficulties now by higher wages and ask them to make "a venture of faith" by adding welfare-work burdens to their other enhanced expenditures, at a time when the condition of the coal market is more seriously demoralized than it has been for a decade?

Mr. Lantz declares that Illinois, like Ohio, is "admittedly progressive." He apparently thinks the Ohio operators should blame themselves and not their wage scale for their lack of progress. In reply, I would say that equal scales may have unequal results in unequal markets. Moreover, it must be remembered that Illinois is, by no

means, uniformly progressive, and some of the newer and finer plants of Illinois owe their existence to the superior quality of their coal and to a difference of wage scale. Thus their erection would witness rather in favor of the writer of the editorial than against him when he urged that fair wage scales result in bettered conditions, had he asserted that the Ohio mines were poorly equipped. But he did not. Let me repeat that he spoke only of "conservation, first aid and housing."

Conservation limps in all parts of Illinois except in the longwall districts. Work there was started long ago, and if the Ohio scale were applied in those mines, mining would not pay. And as to housing, many of the men in the newer and better mining sections of Illinois live in their own homes. There is in such parts, of course, no welfare or housing work whatever, though there is a large amount of first-aid and mine-rescue work, fostered largely by the profits made from thicker and better coal and from wage differentials that are the outcome of such favorable mining conditions. As a whole, Illinois is not a mining state in which adequate profits are made, and as a result the operators are not leaders in welfare work, though they have shown a most enlightened interest in backing the activities of state institutions.

R. DAWSON HALL.

New York City.

Study Course in Coal Mining

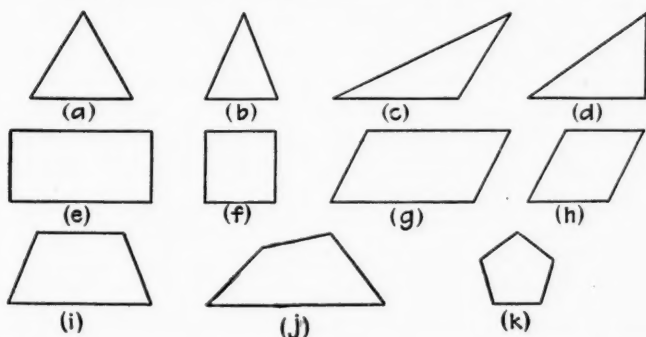
BY J. T. BEARD

The Coal Age Pocket Book

Polygons—A polygon is a plane figure bounded by any number of straight lines, which are the **sides of the polygon**, and which taken together form its **perimeter**.

Polygons are named, according to the number of their sides and their shape, as follows:

A **triangle** is a plane figure having three sides. A triangle



is **equilateral** (a) when its sides are equal. An equilateral triangle is always **equiangular**.

An **isosceles** triangle (b) is one having two equal sides. The angles lying opposite the equal sides are likewise equal each to each. Hence, a triangle having two equal angles is always isosceles.

A **scalene** triangle (c) is one having no two of its sides equal. Likewise, the angles are all unequal.

A triangle is **acute** when all of its angles are acute or **oblique** if one of its angles is **oblique**.

A **right triangle** (d) is one in which one of the angles is a right angle or 90 deg.

A **quadrilateral** is a plane figure having four sides. If the opposite sides of a quadrilateral are parallel, each to each, the figure is a **parallelogram**.

A **rectangle** (e) is a parallelogram whose angles are all right angles.

A **square** (f) is an equilateral rectangle.

A **rhomboid** (g) is an oblique parallelogram.

A **rhomb** or **rhombus** (h) is an equilateral rhomboid.

A **trapezoid** (i) is a quadrilateral having two of its sides parallel.

A **trapezium** (j) is a quadrilateral having no two of its sides parallel.

A **regular polygon** (k) is one that is equilateral.

An equilateral polygon of any number of sides is always equiangular; but, except in the case of a triangle, an equiangular polygon is not necessarily equilateral.

The Coal Age Pocket Book

QUALITIES OF POLYGONS

1. The sum of the interior angles of any polygon is equal to twice as many right angles as the polygon has sides, less four right angles.

2. The interior angles of a regular polygon are all equal, each to each; and each of these angles is therefore equal to their sum divided by the number of sides.

Or, to calculate an interior angle of any regular polygon, divide 360° by the number of sides and subtract the result from 180°.

3. A regular polygon can always be inscribed in a circle whose radius is equal to a side divided by twice the sine of one-half the subtended angle, which is equal to 180° divided by the number of sides.

The radius of the circumscribing circle of a regular hexagon is equal to one of its sides.

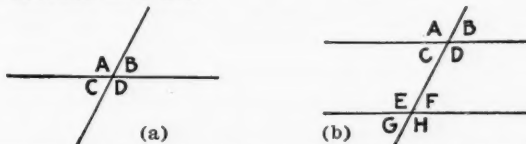
4. A regular polygon is divisible into as many equal isosceles triangles as it has sides.

LINES AND ANGLES

1. The straight line joining two points is the shortest distance between them.

2. Two straight lines can intersect in but one point, which is common to both. Two intersecting straight lines always lie in the same plane.

3. Two straight lines are parallel when they lie in the same plane and can be produced or extended indefinitely, in either direction, without meeting. Parallel lines have the same direction in space.



4. When one straight line intersects another straight line (a) the sum of all the angles formed about the point of intersection is equal to four right angles or 360 deg. Any two angles lying on the same side of one of these lines and on opposite sides of the other are "**adjacent**" angles, as A, B; A, C; B, D; or C, D; while any two angles lying on opposite sides of both lines are "**opposite**" or "**vertical**" angles; as A, D; or B, C.

The sum of any two adjacent angles formed by two intersecting straight lines is always 180 deg.; as $A + B = 180^\circ$; $A + C = 180^\circ$; etc. If the adjacent angles are equal, the intersecting lines are **perpendicular** to each other.

Opposite or vertical angles are always equal; as $A = D$; and $B = C$.

When a straight line cuts two parallels (b) the angles formed are as follows: **Adjacent exterior**, A, G; or B, H; **adjacent interior**, C, D; or E, F; **alternate exterior**, A, H; or B, G; **alternate interior**, C, F; or D, E.

Inquiries of General Interest

Loading Coal by Machinery at the Face

I am working a thin seam of bituminous coal, which is only 2 ft. 8 in. in thickness and overlaid with a hard sandrock roof, while the floor is an almost equally hard limestone. From my own practical experience, in the working of coal, I would prefer to give each man a place by himself; but this is impossible here, under the present conditions. Moreover, the cars we are using are too large and heavy for one man to handle.

I would very much appreciate any information you can give me in regard to the use of a chain machine for loading out the coal at the face. I have been much interested in the many subjects discussed in COAL AGE, but have seen nothing in regard to this matter.

JOHN HARVEY,
Grazier Coal Mining Co.

Foustwell, Penn.

We are somewhat in doubt as to whether correspondent refers to a loading machine, as, for example, the Jeffrey-Hamilton loading machine, which is designed to follow any coal-cutting machine and to gather up the coal and load it into the mine cars after it has been shot down. This machine is operated by two men; and it is claimed will load 1000 lb. of coal per min. into the mine cars at the face. The machine can only be used, of course, where the conditions of roof and floor will permit. It is equipped with a 12-hp. electric motor.

The time saved in the loading of coal by the use of this machine is said to reduce the number of working places required for a given output fully one-half. If this result is realized, in actual practice, there can be no doubt of the advantage gained thereby wherever the conditions will permit of its employment. A greater concentration of the work means less length of entries, air courses and track to maintain; a quicker advance of the working face, whereby the danger incident to bad roof is reduced, less timber destroyed and the coal mined in better condition. The concentration of work at the face also reduces the cost of underground haulage; and this, together with the other advantages named, greatly reduces the cost of production per ton of coal mined.

It is possible that this inquiry refers to the use of a chain conveyor at the working face. Such conveyors are frequently used on a longwall face, in the working of thin seams of coal or where bad roof conditions will not permit the car to be taken along the face.

If any readers have had experience in the loading of coal by machinery at the working face, we should be glad to hear from them and to know the comparative results obtained by the employment of such method. We would also be glad to receive and publish any data of interest in reference to the use of chain conveyors on a longwall face, giving the results obtained thereby, as compared with the use of a track laid along the face of the coal. Any

device that will reduce the cost of handling the coal along the face reduces, to the same extent, the cost of production per ton of coal mined, and should receive the most careful consideration by every coal operator and mine superintendent.

✱

Size of Intake and Return Airways

Assuming that the main intake airways in a large gaseous mine are used as haulage roads and traveling ways and that the mine is in full operation, requiring a ventilating current of 300,000 cu.ft. per min.; which should have the larger sectional area, the intake or the return airways? In answering this question, kindly explain fully, stating the practical conditions that determine the choice.

MINE FOREMAN.

Southwest, Penn.

It is generally stated that the return airways of a mine should have a larger sectional area than the intake airways. The reasons given for this statement are mainly two; namely, the expansion of the return air by reason of its higher temperature due to the heat absorbed in its passage through the mine workings, as well as the increased volume of the return current due to the presence of the gases generated in the mine.

As a matter of fact, however, the cold intake air current, even in the winter season when the outside temperature is much below that of the mine, very quickly partakes of the higher mine temperature, so that there is very little difference observed, in passing from an intake airway to the return, at almost any point in the mine, except in close proximity to the downcast shaft or main intake airways. At the most, this difference will rarely exceed 10 or 15 deg. F.

Since the expansion of the air is proportional to its absolute temperature, it is readily seen that an increase of, say 15 deg. in the mine, for an outside temperature of 32 deg., would only call for an increase of sectional area barely exceeding 3 per cent., which would only mean an increase of 3 per cent. in the velocity of the return air current.

The increase in volume, due to the gases generated in a mine, rarely exceeds 3 per cent. and is generally much less. Taking both of these effects into consideration, it is safe to say that, in general mining practice, the increase in the volume of the return air current will seldom exceed 5 per cent.

There is, however, in a gaseous mine where men enter the main return airway, the danger of the lamps being exposed to a velocity above what is safe in a gas-charged current. For this reason, under such conditions it is often necessary that the area of the return airways shall be such that the velocity will not exceed, say 200 or 300 ft. per minute.

Examination Questions

Hoisting Engineers' Examination, Held at Albia, Sept. 23 and 24, 1914

(Selected Questions)

Ques.—(a) How much will pure water expand? (b) What is the weight of one gallon of pure water?

Ans.—(a) The coefficient of expansion of pure water, referred to its volume at maximum density (39.2° F.) as unity, is expressed by the following formula:

$$\text{coef. of expansion (water)} = \frac{(T - 500)^2}{1000 T}$$

In this formula, T represents the absolute temperature of the water, using 460 as the absolute zero of the Fahrenheit scale. Since water attains its maximum density at, practically, 40 deg. F., it is observed in the formula that the coefficient of expansion becomes zero, at this temperature ($460 + 40 = 500^\circ$ F., abs.)

Applying this formula to find the volume of 1 cu.ft. of water at 200 deg. F., we have

$$\text{volume} = 1 + \frac{(460 + 200 - 500)^2}{1000 (460 + 200)} = 1.03878 + \text{cu. ft.}$$

From this it appears that 1000 cu.ft. of water at 40 deg. F. will increase in volume 38.78 cu.ft., at a temperature of 200 deg. F.

(b) The weight of 1 gal. of pure water, at a maximum density of 39.2° F., taking the weight of 1 cu.ft. of water, at this temperature, as 62.4283 lb., is

$$w = \frac{62.4283 \times 231}{1728} = 8.345 \text{ lb. per gal.}$$

To find the weight of water at any other temperature, this weight must be multiplied by the density of the water as calculated by the formula

$$D = \frac{1000 T}{500^2 + T^2}$$

in which T equals the absolute temperature of the water, in the Fahrenheit scale, using 460 as the absolute zero.

Ques.—(a) How can the accuracy of a steam gage be tested? (b) What kind of pressure does a steam gage indicate?

Ans.—(a) The accuracy of a steam gage is determined by a steam-gage tester, which consists of a handpump, to which is attached an accurate gage. The steam gage to be tested is connected with this apparatus, and its indications are compared with those of the standard gage.

(b) The pressure indicated by a steam gage is the pressure above that of the atmosphere, expressed in pounds per square inch.

Ques.—(a) Define the different kinds of steam. (b) Has steam weight; and, if so, is it lighter or heavier than air?

Ans.—(a) Steam is described as "saturated," "superheated," or "gaseous," "dry" or "wet." When water is heated, it passes into steam, at a temperature corresponding to the pressure supported by the liquid. At normal atmospheric pressure, sea level (14.696 lb. per sq.in.),

water is converted into steam at a temperature of 212 deg. F. At a pressure greater or less than this amount, the temperature of evaporation is above or below 212 deg. F. *Saturated steam* is steam having a temperature corresponding to its pressure.

When saturated steam, not in contact with water, is heated, it follows the law of gases and becomes an unsaturated vapor, which is often spoken of as "gaseous steam." The steam is then said to be "superheated." In other words, *superheated* or *gaseous steam* is steam having a temperature higher than that corresponding to its pressure as a vapor.

Steam is "dry" when it contains no entrained moisture. *Dry steam* may be either saturated or superheated. *Wet steam*, on the contrary, is steam containing some entrained moisture. If wet steam, not in contact with water, is heated, it will first become dry and saturated, the entrained moisture being converted into steam by the added heat. A further application of heat would convert this dry saturated steam into superheated steam, which would then follow, more or less closely, the law of gases known as Boyle's law.

(b) Steam has weight; but its weight is less than that of air, volume for volume. The density of saturated steam is approximately that of water vapor or, say 0.6235, as referred to air of the same temperature and pressure. The density of superheated steam varies directly as its pressure and inversely as its absolute temperature.

Ques.—Describe fully the theory of draft; and explain what causes draft.

Ans.—"Draft," in this connection, is a current of air passing through the furnace. When this current is the result of the heating of the air by the furnace, before the air passes up the chimney, the current is described as "natural draft." On the other hand, a "forced draft" is a current of air that is *forced* through the furnace, by the action of a fan or blower.

Natural draft is caused by the difference in weight between the heated air column in the chimney and a similar column of outside air. The weight of the heated column of air in the chimney is always less than that of the outside air column, for the same cross-section or unit area. These two air columns are in dynamic equilibrium, and the heavier outside column forces the lighter chimney column to rise. *Forced draft*, on the other hand, is caused by the pressure due to the centrifugal force developed in a fan or blower, which pressure drives the air through the furnace and up the chimney, assisted by the natural draft of the chimney column.

Ques.—(a) Is it possible to build and maintain a fire without air? (b) What is the mechanical equivalent of heat?

Ans.—(a) Fire will not burn in the absence of a sufficient quantity of air or oxygen to support the combustion. Draft, by increasing the air supply, increases the rapidity of the combustion.

(b) The mechanical equivalent of heat is 778 ft.-lb., which is the theoretical work performed by 1 B.t.u.

Book Review Department

OUR MINERAL RESERVES. HOW TO MAKE AMERICA INDUSTRIALLY INDEPENDENT. By George Otis Smith, director, U. S. Geological Survey, Washington, D. C. 6x9 in. No illus. Paper cover. Sent free on application.

In this bulletin, under the two headings, "Opportunity for Export" and "Coal," the director of the U. S. Geological Survey discusses the possibilities of our exporting coal, the coals available, etc. The appearance of the statements contained under the second heading, "Coal," in your Sept. 26 issue, prompts me to make some comments and criticisms. The reader will find the quotation, to which I refer, under the caption "The U. S. Geological Survey on the Export Question," on pages 504 and 505 of the present volume of "Coal Age."

In criticism, I would say that, in the first place, it should always be borne in mind, when speaking of our coal exports, that about 50 per cent. of these go to Canada, a market where we have no competition. Furthermore, about half a million tons of the so called exports go to Panama and Porto Rico, our own possessions and places where we have no competition. Deducting these quantities from the 1913 exports, leaves only 4,600,000 net tons exported to the foreign markets where other countries compete with us.

The monograph makes this pronouncement:

"At present, however, while the six European nations that rank next to the United States as coal-mining countries are at war, the demand for export coal from neutral countries is inevitable." Does this mean that the six European nations at war, England, Germany, France, Russia, Austria and Belgium, demand "export" coal from neutral countries, or that the neutral countries demand "export" coal? If the first is meant, the statement is not true, as none of these countries have demanded any coal from the neutral nations. I presume that the meaning the Survey desires to convey is that neutral countries which do not produce sufficient coal for their own use will inevitably demand coal from other neutral countries.

EUROPE AND SOUTH AMERICA TOOK COAL FROM US BEFORE THE WAR

"Already shipments to European and South American countries have begun," says the Survey, and that is, indeed, true, but the beginning was about 16 years ago. Then the text continues: "There is a demand for authoritative information regarding the quality of coal from the different fields accessible to the seaboard." To get such data, we are then referred to the Bureau of Mines Bulletin No. 22 for analyses of coal.

Now, in the first place, these analyses are nearly all of mine samples, which do not represent the coal as it is shipped, and may be very misleading to buyers. Take a concrete case. An English company wishes to buy coal from the best New River mines, to take the place of the best Welsh Admiralty. They go through Bulletin No. 22 and look up the mines showing the best analysis, which gives 15,442 B.t.u. for the dry coal, and 2.40 per cent. ash. They then find out, if they can, who sells this coal, and make their contract for a supply of coal from this mine. Will they get any coal of such quality, even if they do get all the coal from the mine named, which is unlikely? They will not. Nor is the coal from this particular mine one whit better, as put on the market, than the coal from another New River mine, which Bulletin No. 22 gives, for a composite sample, as containing 14,897 B.t.u. and 5.26 per cent. ash. In fact, a large shipment of coal delivered to the government from the latter mine yielded, on analysis by government chemists, 15,314 B.t.u. and 4.28 per cent. ash.

POSITION OF GREAT BRITAIN

"Until the present war broke out," says the Survey, "Great Britain was the only country that exported coal in considerable quantity." What about Germany, with exports last year of 38,722,000 short tons, or 12 per cent. of her total output of 312,062,796 tons?

"But," the Survey adds, complacently, "Great Britain is already beginning to feel the pinch of poverty in her coal supplies." The "pinch" has not yet become apparent to the outsider.

The Oct. 3 issue of the "Iron and Coal Trades Review," one of the two leading British coal papers, says, speaking of collieries supplying Admiralty coals: "In the majority of

cases, stocks (of coal) are excessive." "Secondary and lower qualities are plentiful." "All the cheaper classes of coking and bunker coals are plentiful and easy."

The "Weekly Coal Review" of the "Liverpool Journal of Commerce" says of South Wales coals, under date of Oct. 2, "Buyers are holding off, with supplies of large coal plentiful." "Secondary descriptions and inferiors were plentiful." "Stocks of free coal have accumulated to such an extent that it was difficult to keep collieries going 'owing to shortage of empties.'" "Inferior coals were very plentiful, collieries extending good reduction (in price) for immediate shipment." "Monmouthshires were weak owing to the heavy stocks." These quotations do not seem to the outsiders to indicate a shortage in coal supplies in Great Britain.

During the week ending Oct. 1, there were 81 ships actually chartered to take coal to foreign ports from that island. Of this total, 11 ships were for South America, with a total cargo tonnage of 58,300 tons, and there were 15 ships chartered for Italy to carry 69,600 tons. This looks as if Great Britain was still in the export business, notwithstanding the war and the bad financial conditions in other countries.

THE FUTURE EMBARGO ON COAL

The Survey then ventures on a prediction:

"It is highly probable that when peace is once more established, she (Great Britain) will place restrictions upon her exports of coal." To an outsider, this supposition looks highly improbable.

England's consumption of coal in normal times is only about 66 per cent. of her production; if, after the war is over, her colliery output is decreased, her home consumption will also be less, and the balance between exports and home consumption remain about the same.

But a further quotation must be made from the bulletin of the Survey:

"The total foreign bunker trade at the principal ports, New York, Philadelphia, Baltimore and Hampton Roads, was only about 7,500,000 tons, indicating that most of the transatlantic liners, the majority of which are English, have been carrying from the other side a sufficient quantity of coal for the round trip."

Now, in the first place, the foreign bunkers at the ports mentioned supplied only 6,352,000 tons, and not 7,500,000, the latter being the foreign bunker tonnage for the whole United States.

Of this amount, 4,192,000 tons were supplied at New York alone, which indicates that the transatlantic liners actually did get large supplies of coal on this side, and that is indeed a fact. The large liners have not sufficient bunker space to hold enough coal for the round trip. Take the Lusitania; her bunkers hold 6000 tons, and she uses 840 tons per day. It is a common sight at New York to see coal barges alongside the big liners, from which coal is put in the latter's bunkers.

THE COALS SUITABLE FOR EXPORT

"The high-grade steaming coals of the United States which would be the coals in chief demand for export trade," are given in the bulletin as follows:

Pennsylvania: Clearfield, Allegheny, Somerset; Maryland: Cumberland; West Virginia: Elk Garden, Fairmont, New River, Pocahontas; Virginia: Southwest counties; Tennessee and Kentucky: Eastern counties; Alabama: Birmingham and other districts of Alabama on the south.

The Pittsburgh field of Pennsylvania should be included. Large amounts of Pittsburgh coals are used at New Orleans in foreign trade; also the Kanawha field of West Virginia, while there is no demand for east Kentucky and Tennessee coals for export, and probably never will be, with present freight rates.

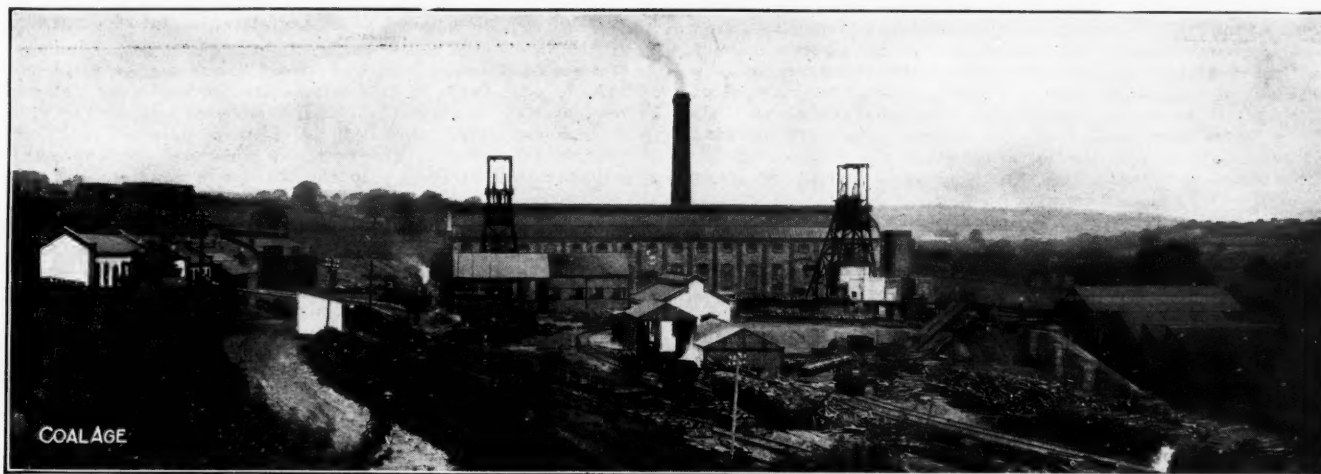
In speaking of the coals "available in highest quality," Clearfield is the only Pennsylvania coal mentioned. Why leave out Somerset and Cambria County coals? There is more fuel and of better quality in those counties than in that of Clearfield; their production is also greater. In 1913, Cambria County produced 19,265,000 tons and Somerset 9,454,000, while Clearfield produced only 8,097,000 tons.

It would be of more help to our coal interests if they were given information on the foreign markets and on the coals

with which they must compete. Any well informed coal man in the tidewater business would know the main facts given in the Survey's article, and would not fall into the errors of assumption by which they are accompanied.—F. R. Wadleigh.*

THE POWELL DUFFRYN STEAM COAL CO., LTD. 1864-1914. 95 pp. 6¼x9¼ in., 1 map and 51 illustrations. Cloth boards.

This book is published by a Welsh coal company, the name of which it bears as title. Ordinarily we do not publish any comment on such books which are rather regarded as pretentious circulars than volumes of public interest. However seeing the present interest in the Welsh coals, this somewhat comprehensive circular beautifully illustrated and extremely interesting, deserves some notice.



THE PENALTIA COLLIERY OF THE POWELL DUFFRYN STEAM COAL CO., LTD.

The colliery is located 15 miles from Cardiff, Wales, and has an annual output of a half million long tons. The two shafts are 21 ft. in diameter and about 2300 ft. deep. The mine is ventilated by a 154-in. Sirocco fan, driven both by steam and electric units. The power is generated by two 3000-kw. Westinghouse Rateau turbines.

We are assured that the company holds up as its motto "Per ardua ad alta" which roughly means "No matter how hard the going we aspire to reach the top." On page 16, we learn how truly that motto has been followed. Since and including 1910 the company has paid a 20 per cent. dividend, free of tax. In 1907 and 1908 a similar dividend was paid, that in 1907, however, not being tax free. It is clear that some companies in Great Britain are not running on a hand-to-mouth basis. Most of our corporations would conceive that they were top notchers if they paid year by year a 20-per-cent. dividend.

Possibly, however, the acquirement of the property in 1864 when the Welsh coal did not have its present standing may have been a cause for the excellent financial position of the corporation. Such a few analyses of Welsh coal are at hand that we feel justified in repeating those of the Bargoed colliery quoted in this book. There is no statement as to the manner in which the samples were collected.

Coal Seam	Fixed Carbon	Ash	Volatile Matter	Moisture
Ras Las	80.22	2.88	16.24	0.66
Brithdir	67.51	5.90	25.76	0.83

The plants are up to date both in equipment and in rescue work. The Aberaman and Rhymney Valley rescue plants are remarkably well fitted having automobile rescue cars which were purchased long before the U. S. Bureau of Mines ordered one for the Pittsburgh station. These rescue stations are owned in common with some other firms operating in the same neighborhood.

FACTS CONCERNING THE STRUGGLE IN COLORADO FOR INDUSTRIAL FREEDOM. Series I, issued by the Coal Mine Managers of Colorado. 72 pp., 6x9 in.; no illustrations or tables. Paper cover.

This book comes to us without even the imprint of the publisher, but we surmise it can be obtained on request by writing to any of the larger operating concerns in Colorado. The preface is signed by the Committee of Coal Mine Managers, J. F. Welborn, John C. Osgood and D. W. Brown. It consists of 15 bulletins entitled "The Struggle in Colorado for Industrial Freedom," issued between June 22 and Sept. 4, 1914, with an introduction entitled "What Has Happened."

*Consulting engineer, 426 Real Estate Bldg., Philadelphia, Penn.

If the public, including our well-meaning but absentee President, would only read it, we are sure its message would sink home. Just casually we pick out a striking passage.

"Instead of the managers hiring miners, the Union is hiring 'strikers.'"

"That the union men of the country who are contributing to maintain this appearance of an effective strike are being misled is indicated by the following statement by Captain Hildreth Frost, of Company A, Second Infantry, National Guard of Colorado, who was also judge advocate in one of the districts of Colorado during the military occupation of the strike zone:

My district included the producing mines of Wootton, Morley, Starkville, Piedmont, Sopris, Cokedale and McLaughlin and the coke ovens of Sopris and Cokedale, the population of the district being between six and eight thousand. There was one tent colony in my district and a large number

of strikers and their supporters. I took a careful census of the entire district and either myself or one of my lieutenants personally examined the union cards of practically every union man in the district. We found approximately 700 men holding such cards. They all bore a stamp showing the date when the men to whom they respectively belonged had joined the union.

I found only one resident who carried a card showing that he was a member of the United Mine Workers of America prior to or at the time the strike was ordered a year ago this July, and only four or five who were members of the union prior to the time the strike was actually commenced on Sept. 23, 1913.

I found that less than 300 of the approximately 700 union card holders in my district were actually in any coal mine in southern Colorado at the time the strike was called. The balance of the 700 had simply joined the union to swell its apparent strength and to draw the stipend of \$3 a week.

PROCEEDINGS OF THE KENTUCKY MINING INSTITUTE FOR THE THIRD ANNUAL MEETING AND MIDWINTER SESSION PRECEDING. Edited by Ivan P. Tashof, secretary-treasurer, Kentucky Mining Institute, Lexington, Ky. 5¼x9 in. One illustration. 134 pp. Paper cover. Free to members.

When proceedings of the smaller mining institutes, which have only a localized membership fall into the hands of the reviewer he does well to deal with them charitably and to remember the difficulties the editor has to meet and that the work is a labor of love and not of compensation. We use the word "love," of course, in its tennis significance for no one becomes so "enthused" in his work of editing proceedings that he becomes seriously enamored of his task.

When, therefore, we receive proceedings adequately edited and without flaws, so far as we can discover from cover to cover, and know that the editor is also grand factotum of the institute and has to perform all the duties of secretary and treasurer, where only too many members forebear to pay unless dunned, we feel like expressing ourselves in the highest of praise.

The papers in this work are of excellent quality, for the Kentucky Institute is a lively body. No one appears before it to rehash material taken from some time-honored textbook. On the whole too there is little space taken up with the usual regrets that the price of coal is no higher than it is. As much of the material is in 6-point type for purposes of condensation, the book contains more information than most books of similar size. A photograph of H. L. Viers, the Institute president, appears on the front page.

Coal and Coke News

Washington, D. C.

President Wilson has seemingly taken a step toward the settlement of the Colorado mining troubles by appointing a committee to take the matter in hand, investigate the circumstances, and if possible, dispose of it.

The strike of the miners in Colorado, which has now lasted for 12 months, has attracted the attention of the whole country, and has been accompanied by many distressing and tragic circumstances. The mediation of the government of the United States was offered early in the struggle, but the operators of the mines were unwilling to avail themselves of it, or to act upon the suggestions made by representatives of the Department of Labor. It became necessary to send Federal troops to the district affected by the strike in order to preserve the peace; but their presence could of itself accomplish nothing affirmative.

On a statement issued, the President says:

I do not feel that I am at liberty to do nothing in the presence of circumstances so serious and distressing. Merely to withdraw the Federal troops and leave the situation to clear and settle itself would seem to me to be doing something less than my duty after all that has occurred.

I have, therefore, determined to appoint the commission contemplated in the plan of temporary settlement, notwithstanding the rejection of that plan by the mine operators, and thus at least to create the instrumentality by which like troubles and disputes may be amicably and honorably settled in the future, in the hope that both parties may see it to be not merely to their own best interest, but also a duty which they owe to the communities they serve, and to the nation itself to make use of this instrumentality of peace, and render strife of the kind which has threatened the order and prosperity of the great State of Colorado a thing of the past.

The Hon. Seth Low, of New York, Charles W. Mills, of Philadelphia, and Patrick Gilday, of Clearfield, Penn., have most generously and unselfishly consented, at my request, to serve as members of the commission. I owe to these gentlemen my own warm thanks not only, but also, I believe, the thanks of their fellow citizens throughout the country. They will place themselves at the service alike of the miners and the operators of the mines in Colorado in case controversy between them should in the future develop circumstances which would render mediation the obvious way of peace and just settlement.

That the strike in Colorado is now entirely over, insofar as it affects the ability of the Colorado Fuel & Iron Co. to supply the market requirements of coal, is set forth in the annual report to the stockholders of that company by President J. F. Wellborn, which states:

Our former employees have been very anxious to secure work again at our mines, and we have quite willingly taken back such as we had reason to believe were not connected with past violence. The result is now a working force that is producing sufficient coal to more than supply the somewhat reduced market requirements. At no time during this struggle would we have been unable to produce sufficient coal to meet all demands, had order been maintained and the men desiring to work been free from violence.

The charge has often been made that the state troops were under the control of the coal companies. There is no foundation in fact for this charge. The relations between ourselves and the state soldiers were the same in every essential particular as those that have existed between us and the Federal troops. We have looked upon both as the proper peace officers of the district. Our employment of camp marshals in normal times has been heralded broadcast by the so-called labor leaders as a "notorious and criminal guard system." Our practice, in fact, has been to employ the smallest possible number of such men, and for a long time before the strike was called we had but seven camp marshals at our 22 working properties. They also acted as sanitary and truant officers, as well as being charged with the care of miners' houses.

PENNSYLVANIA

Anthracite

Harrisburg—The blank forms for returns of industrial incomes under the income tax are now ready. They will be mailed by the collector of the district about Jan. 1, and must be returned before Mar. 1. It is specifically stated that royalties on coal will be subject to taxation.

Wilkes-Barre—Members of the Tri-District Executive Board, which includes districts Nos. 1, 7 and 9 of the anthracite region, United Mine Workers of America met here on Nov. 28, to prepare a legislative program. The officers of District No. 1 named David Fowler, of Scranton, a board member, to fill the vacancy caused by the death of M. J. Healey.

West Mahanoy—The Board of City Trusts of Philadelphia has applied to the Schuylkill county court for permission to make the public roads in the township. This is one of the wealthiest townships in the state, the coal lands owned by the Girard estate being worth many millions of dollars. As the estate is the largest taxpayer in the district, the right to make the roads is claimed under the Losch act. The Philadelphia & Reading Coal & Iron Co. and the Lehigh Coal & Navigation Co. also asked to be permitted to make contracts with a score of townships.

Hazleton—Between 3000 and 4000 Italians employed in the anthracite coal fields in this immediate district were notified by mail on Nov. 25, that they must report for military service to the nearest Italian consul for enrollment before Dec. 31, or be adjudged deserters. The notice is construed to denote the speedy entrance of Italy into the European conflict.

Drifton—Thousands of miners' families in the Lehigh region sent congratulations on Nov. 26, her 73d birthday, to Mrs. Eckley B. Cox, widow of the Drifton coal operator and called the "angel of the coal fields" because of her many years of benefactions. Mrs. Cox is now actively engaged in preparation of Christmas presents for 3500 children of the towns on the Cox lands.

Shenandoah—A serious fire broke out on South Mountain on Nov. 26, and destroyed much valuable timberland. The McTurk breaker and washery, employing hundreds of men and boys, were on fire a number of times, but each time the fire companies extinguished the blaze and did heroic work in diverting and checking the flames. The breaker and washery were only slightly damaged.

Hazleton—So many quarrels developed over the hostilities in Europe among the English, Irish, German, Slavish, Russian and Balkan mine employees that the output at the Cranberry mine of A. Pardee & Co. was reduced. An order has accordingly been issued to the effect that anyone of the 1500 employees who discusses European conflicts will be promptly discharged. The management is evidently attempting to enforce its neutrality.

Wilkes-Barre—A recent explosion of gas in the No. 20 Maxwell colliery of the Lehigh & Wilkes-Barre Coal Co., caused the serious injury of a miner and his laborer. Both were seriously burned, and were taken to the city hospital, where the condition of one of the men was pronounced serious.

Shenandoah—The Mill Creek Coal Co. which a short time ago opened up the old workings of the Wolf Creek Coal Co. near St. Clair, recently made its first shipment. The coal is being sent to the new Boston colliery for preparation.

Bituminous

Jerome—The big tippie of the No. 3 mine of the Jenner-Quemahoning Coal Co. was badly damaged by fire recently and would probably have been totally destroyed, but for the heroic efforts of miners. The mine is now running without the use of the tippie, which will be repaired immediately. The mine has plenty of orders and is working steadily, in contrast with many other of the coal operations of this place.

Connellsville—The production of the Connellsville region is still above 200,000 tons per week. This will be reduced slightly for a short time, due to the fact that some of the furnaces of the U. S. Steel Corporation have been overstocked with fuel and are cleaning up their stock piles to a certain extent. Many of the Frick ovens are now banked, but have not been put out of blast.

Bellefonte—Two new coal deposits were recently found in the Snow Shoe region, one being a 4-ft. measure belonging to the Lehigh Valley Coal Co., and the other a 5-ft. bed at the mouth at Beauty Run, belonging to the Kelly Bros. Both owners recently completed a thorough test by drills in the territory underlaid, and each will develop the property by opening extensive operations. Modern machinery will be employed, and a large number of miners will be put to work.

Pittsburgh—The John B. Shannon Co. has recently sold for James B. Manning, of New York, to the National Coal & Fuel Supply Co., of Columbus, Ohio, 5000 acres of coal property near Grundy in Buchanan County, Va., for \$150,000. The

sale includes not only the mineral rights, but the timber and surface as well. The new owners expect to operate the property, the Norfolk & Western R.R. passing through the tract.

Pittsburgh—In an opinion handed down Nov. 7, Judge Charles B. Orr in the United States District Court, refused the petition of the Girard Trust Co. to join the receiver of the Pittsburgh-Westmoreland Coal Co. in the foreclosure of a mortgage given by that company to secure payment of 6 per cent. two-year gold notes in denominations of \$1000 each to the aggregate sum of \$900,000. Leave was granted to the receivers of the coal company to issue certificates in the sum of \$350,000 to carry on the business.

WEST VIRGINIA

Welch—All the mines owned by the U. S. Steel Corporation in the Pocahontas and Thacker fields will resume operations at once. This means the employment of many men who have been idle or working only part time. The demand for the output of these mines has not been sufficient during the last few months to justify their full operation, and consequently a large reduction in working forces was made.

Herberton—The property of the Herberton Collieries Co. has been purchased by the Willis Branch Coal Co., of Beckley, W. Va. It is understood that the new owners will not open the mines formerly operated by the other concern, but will start new operations.

ALABAMA

Sayreton—The Republic Iron & Steel Co., of Birmingham, is making extensive improvements at Sayreton, the banner coal mines of the state. Automatic doors are being installed and the mine is being electrified.

Charles M. Barnett, formerly president of the Chesapeake & Ohio Coal & Coke Co., has been elected president of the Atlantic States Coal & Coke Co., of Richmond, Va., to succeed C. E. Bockus. The policy of the company has broadened considerably in the export business, and it expects also to participate largely in the coal trade of the Middle West.

Birmingham—J. P. Pearson and R. A. Monaghan have been named by E. M. Dryer, referee in bankruptcy, as receivers for the Central Coal Co., which concern recently filed a voluntary petition in bankruptcy. The liabilities of the Central Coal Co. are listed at \$292,697.97, and the assets at \$190,300.

Approximately 16,000,000 tons of coal were mined in the State of Alabama last year. The value of this output was \$21,000,000. During the time there were 125 fatal accidents, according to the report of J. T. Gorman, examiner of public accounts. There are 302 coal mines, in which 25,000 men are employed.

A voluntary petition in bankruptcy was filed in court by the Mountain Valley Coal & Coke Co. of Jefferson County. Liabilities were placed at \$52,596, and assets at \$30,203.21. John W. Cook was appointed receiver.

D. J. Parker, of Birmingham, has gone to Pittsburgh to assume the duties of mining engineer in the government service. The appointment was the result of an examination in which he took third place out of a thousand competitors.

KENTUCKY

Berea—Coal companies in this part of the state are preparing to take advantage of the Workmen's Compensation Act which is to become effective on the first of the year. The cost of going in with the state is little more than that of liability insurance and it is said that numbers of the companies in this section have been refused liability insurance because of the frequency of accidents.

Greenville—Activities of the "Possum Hunters" are declared to have practically ceased in this part of western Kentucky where there was considerable violence in the last several weeks. It is reported that there is much apprehension as to recurrence of the troubles but no particularly notorious cases have been reported. Judge J. J. Rice has added another \$200 to the reward offered for apprehension and conviction of the persons who hanged Henry Allen and for those who later whipped Frank Lee and I. E. Covington.

Plneville—Although the coal-mining operations in this part of the state have been on a reduced scale for several weeks, conditions are showing steady improvement. Many mines which have been running on short time are working longer hours and prospects are considered to be favorable to more extended operations in the near future. The fact that the Harlan Coal Mining Co. has recently opened up a second operation at Kayu, near Coxton, its original operation, is considered a special indication of better times. The Harlan company has just completed 100 new houses for its employees and is making other improvements in its settlement.

Whitesburg—Since the advent of rough, snowy weather, with extreme cold there has been considerable improvement in the eastern Kentucky coal fields, especially in the Jenkins-McRoberts-Fleming fields, and a number of mines have resumed operations after being closed down for several days. In fact all over the coal fields there has been a notable improvement, and a better market now exists generally. As a result a large number of miners are now working.

Hazard—All the mines around Hazard, especially those of the Ashless Coal Co., the Hazard Coal Co., the Hazard-Dean Coal Co., the Kentucky Jewel Coal Co., the East Tennessee Coal Co., and the Wolf Creek Coal Co., are all running full time, and a general improvement of market conditions is noted. There is especially great activity in and around the Hazard field.

OHIO

Pomeroy—The two mines of the Essex Coal Co., located in the Pomeroy Bend field, have been opened and each is shipping about 500 tons daily. Both are electrically equipped and the capacity will be increased to about 1500 tons each by spring.

Cleveland—Operators and miners of No. 8 field held a joint conference in Cleveland, Wednesday morning. National President John P. White and National Secretary William Green, of the United Mine Workers of America, President John Moore, of the Ohio district, President Charles Albasin, of the eastern Ohio sub-district union, and delegates from the unions attended. This was the largest gathering of miners since the Wheeling conferences. No preliminary arrangements had been made and the whole situation was gone over as if nothing had previously been done.

Martins Ferry—It was reported recently that the Gaylord mine, which has been idle since Apr. 1, when the miners went on strike, will probably never again be opened. It is certain that this mine in filling up with water and several falls of rock have already occurred. No men have been employed to keep the mine clean, and it is said that it is in a bad condition from the long idleness. It is believed that many mines in this vicinity are in the same condition.

Cincinnati—The city has brought suit against the Paint Creek Collieries Co. for \$7000, which is claimed to be due for the use of the water front for the past three or four years. The suit was filed in Scranton, Penn. It is alleged that the company, which has been using a certain space along the water front for a number of years, paid the city \$500 every three months for the privilege, up to three and a half years ago, when payments ceased, and the suit has been brought to compel the payment of dues, and to adjust the rights of all parties.

INDIANA

Paxton—A strike at the J. Wooley Coal Co.'s mine has been settled by the state board of miners and operators. The company has been charging \$3.25 for 25 lb. of permissible powder and the miners held that black powder, costing \$2.72 would do the same amount of blasting. The company agreed to sell the former powder at the price of the latter, the miners to furnish their own detonating caps.

ILLINOIS

Sesser—Plans are under way for another mine near here, which will be sunk by A. Watts, Sr., and his son, in connection with Jesse Diamond, who is already interested in other Franklin County mines.

Royalton—The report made during the past week to the Governor of Illinois, by United Mine Workers officials, that the widows and orphans of the 52 miners, who lost their lives in the Royalton explosion, were destitute, is entirely without foundation. The operators claim that this malicious report has been spread to create an ill feeling against the unfortunate operators. J. L. Mitchell, principal owner of the Royalton property, is taking care of every one of the dependants of the deceased miners who might be in need, and there is absolutely no suffering or destitution of any kind.

East St. Louis—The Interstate Commerce Commission is holding a hearing, in an effort to determine whether some of the coal roads entering East St. Louis should be classified as industrial roads or as common carriers. At the present time they enjoy the privileges of common carriers, and if they are classified as industrial lines, they will be allowed a switching charge on coal from the mines to East St. Louis, and will not participate in the through coal rates.

Cantine—Mine No. 3 of the Lumaghi Coal Co. has been shut down permanently, on account of lack of business. This mine had an output of 1000 tons a day, and up until a month ago, worked steadily.

Percy—Finding the mining business in anything but a flourishing condition, the Willis Coal & Mining Co. has decided to go into the dairy business, and several hundred acres of land, which has been undermined, has been laid out by the Willis people in a \$75,000 dairy farm, \$25,000 being paid for the milk cows alone.

Staunton—A short time ago the DeCamp coal mine was sold for \$5000. Recently the president of the company applied to the Circuit Court of Madison County, asking that approval of the sale be withheld, as the figure named is far below the value of the property, which is estimated to be \$51,000.

ARKANSAS

Fort Smith—Practically every miner who was arrested last week on indictment returned by the Federal Grand Jury, investigating the Hartford Valley mining troubles, has been released on bond. Latest reports from Prairie Creek are to the effect that everything is quiet and work has been resumed, although not on a large scale.

Heber Springs—Plans are almost completed for the development of coal mines near here, by Mortimer Frauenthal.

OKLAHOMA

McAlester—Sixty-seven tracts, including about 10,000 acres of segregated coal lands, were withdrawn from the market when the government sale was opened Nov. 25, because of protests by coal operators. Nearly 100,000 acres of leased land has already been withheld.

FOREIGN NEWS

Sydney, Nova Scotia—The Dominion Coal Co. has completed its shipments from Sydney to the St. Lawrence market for the season. In consequence, work at the various mines has run slack, and will probably continue so until banking operations are resumed about the middle of December. After the beginning of the new year, operations will be good, it being said that the collieries will work about three-quarter time.

PERSONALS

J. H. Tidmore, superintendent of the Banner mines of the Pratt Consolidated Coal Co., Birmingham, Ala., recently resigned.

James S. Thompson, formerly of Colorado, has accepted the position of general superintendent for the Utah Fuel Co., with offices at Castle Gate, Utah.

Robert M. Irving, of Terre Haute, Ind., has resigned his position as general superintendent of the Monon Coal Co. His successor has not yet been appointed.

James M. Page, who recently resigned as superintendent of Rex No. 1 Mine, at LaFollette, Tenn., is now superintendent for Gaviano & Co., coal operators, at Ludlow, Colorado.

J. F. Webb, assistant state mine inspector of Alabama, in charge of the Third District, recently resigned his position, to take charge of the Banner mines of the Pratt Consolidated Coal Co. as superintendent.

Julius Bierach, manager of the Louisville office of the St. Bernard Coal Mining Co., is confined to his bed at the Deaconess Hospital in Louisville, where he recently underwent an operation. He is reported progressing favorably and is expected to be able to return to his desk by the middle of December.

E. T. Stotesbury, president of the Piney, Crab Orchard and White Stick coal companies, announces their dissolution, having surrendered to the State of West Virginia their charters and corporate franchises. After the sale of said properties and all debts and obligations are discharged, the balance will be divided pro-rata among the stockholders.

T. R. Ragland, formerly superintendent of the Fort Defiance Coal & Coke Co.'s operation at Gauley Bridge, W. Va., has taken charge of the new mines of the West Virginia Coal Mining Co. at Skeleton. This operation is on land leased from the Beaver Coal Co., and over 2000 tons were shipped last month.

In the accident on a Burlington suburban train recently, in which several cars caught fire, P. C. Richards, of Richards & Ambler Co., was severely burned about the head and hands. He is now in St. Anthony's Hospital, Chicago, and it is reported that he will not be able to be out for at least 10 days. A number of other coal men were on the train, but Mr. Richards was the only one injured.

Colonel R. J. Stegall, for the past 10 years purchasing agent for the New River Co. at Macdonald, W. Va., recently severed his connection with that company preparatory to assuming his new duties as clerk of the County Court, to which office he was recently elected. M. C. Moore, who has been in the purchasing department for the past two years, succeeds Colonel Stegall.

W. L. Moke, of Adena, Ohio, head of the Roby Coal Co., the Roby-Somers Coal Co. and the A. G. Blair Mining Co., was recently made general manager of the Lehigh Valley Coal Co.'s properties. The latter firm has had a million tons annual output, but will open another mine and develop a new property which will mean a considerable increase in the tonnage under Mr. Moke's supervision.

CONSTRUCTION NEWS

Martins Ferry, Ohio—A new coal mine has been recently opened on the narrows south of Shadyside.

Shenandoah, Penn.—Work on the new steel and concrete breaker of the Lehigh Valley Coal Co. at Packer No. 5, is being pushed with all possible speed.

Seranton, Penn.—The Lehigh Valley Co. recently placed a force of men at work repairing the Yorktown Washery of the Spring Brook Colliery which has long been idle. Operations at this development will be resumed at once.

Johnstown, Penn.—The W. H. Hughes Coal Co. has begun the installation of an electric haulage system at its mine at Bens Creek. It will also make other improvements that will increase the capacity of the plant from 400 tons to 1200 tons per day.

Wheeling, W. Va.—A force of men was recently put to work making repairs on the Semet-Solvay coke plant at Wheeling. It is understood that two large smoke stacks will be rebuilt and other repairs requiring several weeks will be effected.

Birmingham, Ala.—The Tennessee Coal, Iron & R.R. Co. has commenced work on the construction of a building, 80x200 ft., for the manufacture of fertilizer from slag. The cost of the plant will be \$250,000 and a large number of men will be employed.

Rockwood, Penn.—The coal tract northwest of Rockwood in Milford Township is again being investigated by promoters. It is proposed to build a standard gage track connecting the proposed mines with the Somerset & Cambria line. The plant, if built, will be modern in every way.

Piedmont, W. Va.—The Maryland Coal Co. has announced that improvements costing many thousands of dollars will be made at its plant. The plant will be modernized for the mining of thin coal, and more than 300 men will be employed. It is estimated that the company will ship over 1000 tons of coal daily. An electric haulage system will be installed.

Wilkes-Barre, Penn.—A large concrete shaft is being sunk by the Delaware, Lackawanna & Western R.R. Coal Dept., at Nanticoke. The caisson method, which has not been employed to any great extent in the anthracite field, is being followed. The new shaft will have two hoistways, a pipeway and an airway, while its greatest dimension will be 52 ft. 3 in.

Cincinnati, Ohio—The Reliance Coal & Coke Co., which recently made arrangements for the purchase of the property and business of the White Oak Coal Co., is building at a point 10 miles below the city a coal-handling and storage plant with a capacity of 100,000 tons, at which it will take care of coal from up the river as well as from its mines.

NEW INCORPORATIONS

Bristol, Va.—An amendment has been filed to the charter of the Blacok Coal Land Co., reducing the capital stock from \$1,500,000 to \$15,000.

Duquoin, Ill.—The Granger Coal Co. has been organized with a capital of \$30,000. The incorporators are A. G. Graham, C. F. Quick, O. M. Roberts.

Middlesboro, Ky.—The Low Ash Mining Co. has been organized with a capital of \$5000. The incorporators are E. B. Nicholson, F. D. Hart, Jr., M. H. Rohrer, and J. D. Simpson.

Switzer, W. Va.—A charter of incorporation was recently issued to the Alemma Coal Co., of Switzer, Logan County. This company has an authorized capital of \$25,000 and the

incorporators are Fred C. Prichard, Rufus Switzer, Thomas A. Wiatt, R. H. Williams, and J. M. Vest.

Mullens, W. Va.—Organization has been effected by the Hardy Coal Co. with officers as follows: President, J. A. Wood; vice-president, Frank A. Prince; secretary, D. H. Mead; treasurer and manager, J. C. Sullivan. This firm plans a daily output of about 1500 tons which will be secured through electrical equipment, the machinery to be purchased during the next 30 days.

INDUSTRIAL NEWS

Cambridge, Ohio—Two mills of the American Sheet and Tin Plate Co. have posted notices that they will be closed until Jan. 1, 1915; 800 men will be idle from these plants.

Birmingham, Ala.—The Mountain Valley Coal & Coke Co. recently filed a voluntary petition in bankruptcy. The liabilities were given as \$52,596 with assets of \$30,203.21. John W. Cook was appointed receiver.

New Lexington, Ohio—The property of the former Lilly-Hocking Coal Co., located one mile east of New Lexington, was sold at public sale Nov. 28, by John F. Nugent, receiver for the Weaver & Dufraine Coal Co.

Washington, D. C.—Sixty vessels of the United States Navy, six of which are battleships, are now burning oil instead of coal. It has been found that the oil occupies less space, weighs less, and gives a larger steaming radius.

Viper, Ky.—The Viper Coal Co. recently organized to make developments announces that it will be ready to begin shipping coal within the next 30 or 40 days. It will have a daily capacity of about 1500 tons when fully under way.

Put-In Bay, Ohio—The "Isabella J. Boyce," a steam barge belonging to the Pringle Barge Line Co., of Cleveland, caught fire while bound from Cleveland to the upper Lakes with a load of coal, and had to be abandoned. She and her cargo are believed to be virtually a total loss.

Knoxville, Tenn.—A twenty-five per cent. improvement in the domestic coal market has resulted from the recent cold snap, according to the leading coal merchants of this section who also report that the steam market also has taken a brace.

Charlestown, W. Va.—The industrial conditions in West Virginia continue to show a slight improvement. New industries continue to announce their plans for opening business in the state. Among these the Pursglove-Maher Coal Co., of Cleveland, Ohio, is reported to have taken an option on coal land in the Island Creek district of West Virginia.

Columbus, Ohio—The Alma-Thacker Coal Co., of Columbus, of which Charles Cohenour is president, is opening four mines near Williamson, W. Va., on property recently acquired. The property consists of 2000 acres and the capacity of the mines will be 2000 tons daily. Shipping will start as soon as the spur of the Norfolk & Western Ry. to the property is completed.

Wheeling, W. Va.—Suitable mine timber is becoming an expensive problem in many of the older coal-producing districts of this state. It is believed that the steel mine prop, which has been for some time in successful use in Ohio and other states, will grow in favor as it becomes more generally understood that this prop can be removed and used oftener than wood.

Lexington, Ky.—Suspension by the Interstate Commerce Commission of the "long and short haul clause" will stimulate the coal industry of eastern Kentucky, railroad officials believe, as it will place the mines there in reach of the big coal markets in the West and North, especially for coking coal which is much in demand in the large manufacturing plants in that section of the country.

Toronto, Canada—A discovery of lignite has been made in boring for a well in North Cobalt, Ont. It was struck at a depth of 25 ft., and though of inferior quality at the top it is believed that it will improve with depth. A thorough exploration will be made next spring. In view of the fact that all coal used in North Ontario has to be imported the discovery is regarded as of considerable economic importance.

Jenkins, Ky.—The Elkhorn & Shelby Creek Coal Co., C. G. Evans president, is asking, it is said, for prices on second-hand mining machinery, the shortwall type preferred; 250 volts 48 in.; nothing less than 6-ft. bar. W. J. Christopher is manager of the company, which will develop 400 acres of coal property, expecting to have a normal output of from 600 to

700 tons. All the machinery except the mining machines is provided for.

Chicago, Ill.—The Chicago Coal Merchants Association held its biweekly meeting in the offices of the association this week, and announcement was made that arrangements have been effected with a prominent insurance company whereby members of the association can secure a saving in the cost of their insurance. Mr. Adams' article suggesting uniform screening arrangements, which has been widely discussed, was read, and the members asked to submit their opinion later in regard to the proposed plan.

Bluefield, W. Va.—As a sequel to the resumption of operations in certain of the steel works of the country, the demand being made upon the Norfolk & Western R.R. is believed to be prophetic of a lively pick-up in the mining business within a short time. It is hoped that by the first of the year the coal output will be not far short of normal. With the markets of the world opening up for new business, it is believed that coal mining will reach a high mark hardly later than the first of the year.

Fayetteville, W. Va.—The coal billing records of the Chesapeake & Ohio R.R. for the years prior to 1914 were recently destroyed when the billing office in the East Thurmond yard was burned. The fire occurred about two o'clock a.m., and the building was being fast consumed when the billing clerk who was asleep therein, was awakened. His first thought was for the records, and without dressing he rushed into the office, and succeeded in removing the books covering the past year's business. Nothing else was saved.

Whitesburg, Ky.—The middle of December will see the first trains running through the famous "breaks" of the Big Sandy River, with the completion of the Carolina, Clinchfield & Ohio R.R., between Elkhorn City, Ky., the terminus of the Chesapeake & Ohio's Big Sandy branch, and Dante, Va., 35 miles distant. This is regarded as the most important railroad connection made in years in eastern Kentucky and will open up a large area of coal and timber lands. The construction was accomplished at tremendous cost. In the 35 miles of railroad there are 34 tunnels.

Washington, D. C.—The constitutionality of the coal-mining laws of Ohio will be tested in the United States Supreme Court which will hear the argument of the Rail & River Coal Co. in its case against the Industrial Commission of Ohio. The operators will claim that because of the law recently enacted the coal-mining industry of the state is practically at a standstill; that the loss to operators and employees in profits and wages has already reached an enormous total. Another interesting argument will be heard in the case of the Jeffrey Mfg. Co. involving the validity of the Ohio Workmen's Compensation Law.

Charleston, W. Va.—Coal and coke shipments over the lines of the Chesapeake & Ohio Ry. during the month of September and the first nine months of the year, have been made public in the statement issued by O. D. James, auditor of freight traffic. These continue to show an increase over last year. The statement shows that 2,019,730 tons were shipped during the month, as against 1,612,323 tons for the same month in 1913, an increase of 407,407 tons. For the first nine months of the present year 15,860,912 tons were shipped, as against 12,854,766 tons for the corresponding period in 1913, an increase of 3,006,146 tons.

Birmingham, Ala.—Coal companies with properties along the Warrior River are preparing for the completion of lock No. 17. The Pratt Consolidated Coal & Coke Co. is leading in this work. This firm is constructing barges at Holt where it has a building plant. Seventeen coal mines are either ready or will be ready to dump coal from the mine tipples onto barges when lock 17 is completed. Before the end of 1915 the Warrior River will be navigable for vessels of 6-ft. draft the year round from Cordova, 76 miles north of Tuscaloosa, to the Gulf. This will bring coal mines in Jefferson and Walker counties in direct touch with tidewater for all time to come.

Charleston, W. Va.—The statement of shipments of coal and coke over the lines of the Norfolk & Western Ry., for the month of October and for the first 10 months of the year, has been issued by T. D. Hobart, general coal freight agent, and while the October shipments show a decrease the shipments for the 10 months of the present year still show an increase over 1913. According to the statement 2,061,464 tons were shipped during October, as compared with 2,209,261 for the same month in 1913, a decrease of 147,797 tons. For the 10 months of the year the statement shows 22,849,014 tons, as against 21,325,120 tons for the same period last year, or an increase of 1,523,894 tons.

Coal Trade Reviews

General Review

Warm weather threatens the anthracite market with a general slump. Bituminous situation dull and no improvement in sight. Middle Western market beginning to stiffen up notably.

The warm weather has slowed up the demand for anthracite to such an extent that the market is being maintained with the greatest difficulty. The independent operators are curtailing operations heavily, and the large companies are forcing the market in every direction in order to maintain their working schedules. The domestic sizes are failing utterly to show their customary form, but the weakness centers more particularly on the steam grades, due to the excessive production, mild temperatures, decreased industrial activity and general demoralization in bituminous coals with which they are in close competition. If the high temperatures continue much longer, a general slump in anthracite is inevitable.

While basic conditions in bituminous continue to show indications of a turn for the better, the closest scrutiny of the market fails to disclose any important change. Some slight improvement is apparent in the movement on contracts, but the spot demand continues as dull as ever and occasional market cargoes are still noticed; as a matter of fact, were it not that operators are more cautious than ever before about shipping consignment coal, the market would probably be demoralized.

Under the stimulus of a slightly improved tone in general manufacturing, the Pittsburgh district has withstood the reverse incident to the cessation of Lake shipping in a most excellent manner. Some forced sales were, of course, hardly to be avoided, and there are still sufficient cut prices in evidence to cover all the spot demand but producers are showing an increasing determination to obtain full circular prices.

In spite of the return of warm weather, Ohio consumers seem to have felt the danger of low stocks, and buying is still continuing. Dealers are placing immediate, if not urgent, orders, and there is a better tone in evidence in all directions. Screenings have stiffened up in excellent shape, and the outlook in steam coal seems more hopeful. Some inclement weather has also had a stimulating effect on the Southern markets, though the situation is not appreciably changed as yet, and it will require considerable cold weather to create any great activity.

It is evident that the Middle-Western consumers have not stocked their usual winter requirements as a great many orders are still arriving in spite of the return of warm weather. These orders are quite frequently urgent, and a good many companies are now on full working schedules. Practically all the demurrage coal seems to be cleaned up, and a fair business is anticipated throughout the balance of the season.

ATLANTIC SEABOARD

BOSTON

Little change in situation of Pocahontas and New River. Panama R.R. bids considered significant. "Market cargoes" still in evidence. Dull outlook for Pennsylvania grades. Anthracite demand slow.

Bituminous—The market this week is almost featureless. Prices on Pocahontas and New River are practically unchanged, a few spot sales still being made at prices little if any in excess of \$2.50. The amount of tonnage of standard West Virginia coals offered the Panama R.R. at \$2.70 or less is some indication of the view certain shippers take of the market for several months ahead, and it is extremely doubtful now if the \$2.85 basis can be maintained next spring. The year of 1914 as a whole has been an object lesson to New England buyers who rushed in to tie themselves up with long-term contracts, and it will probably be hard persuading many of the important buyers to make contracts for 1915.

In New England the spot demand is light, but an improvement is shown in the call for shipments on contract. The

improvement, however, is not sufficient to have any appreciable effect on the large volume of coal still standing at the Virginia terminals. It is generally understood now that the Boston & Maine, as well as the New Haven R.R., is to take Cape Breton coal as a part of its requirements, and the whole transaction has called forth a lot of comment.

An occasional "market cargo" of Pocahontas or New River is still heard from. Unsold balances at Providence have lately been sold as low as \$3.20 on cars, a price that can hardly net \$2.50 f.o.b. Hampton Roads. Georges Creek is in better supply than when last reported; cargoes are coming forward with normal regularity, and there is no longer any fear of a shortage of this grade later in the season.

The outlook for the Pennsylvania coals is no brighter than for several weeks past. The last cargoes for the season have now gone forward to points like Bangor, which will soon close to navigation and general inquiry is light. It is interesting to see that some of the higher grades are active competitors for Government business at Philadelphia as against the Pocahontas and New River shippers at Hampton Roads.

Anthracite—The state of trade is much dependent on the weather. A fortnight of low temperatures would create an active demand on the shippers, but as it is orders are few.

Quotations on bituminous at wholesale are about as follows:

	Clearfields	Cambria Somerset	Georges Creek	Pocahontas New River
Mines*	\$0.85@1.45	\$1.15@1.50	\$1.67@1.77	
Philadelphia*	2.10@2.70	2.35@2.70	2.92@3.02	
New York*	2.40@3.10	2.65@3.05	3.22@3.32	
Baltimore*			2.85@2.95	
Hampton Roads*				\$2.50@2.75
Boston†				3.40@3.73
Providence†				3.20@3.58

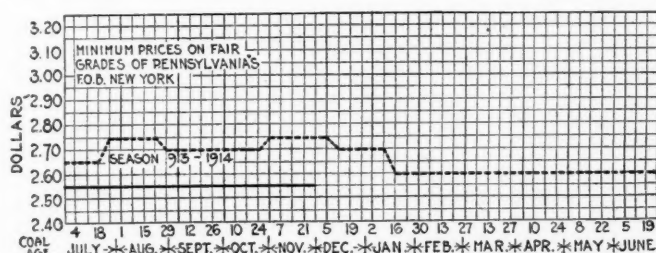
* F.o.b.

† On cars.

NEW YORK

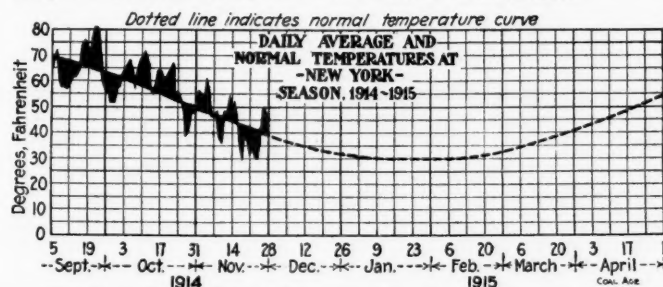
Some bituminous on demurrage and the market occasionally forced. Slack stiffer. Anthracite slowing up. Individuals curtailing production and large companies putting some sizes back into storage.

Bituminous—While many operators continue optimistic as to the future, the market still fails to show any important indications of a recovery. In fact were it not that producers have been more cautious about sending consignment coal forward than ever before, it is probable that the trade would now be utterly demoralized. Even as it is the market is occasionally being forced with coal on demurrage and there was a large tonnage unloaded from one of the German vessels last week because it was showing indications of firing. Mining schedules are heavily restricted, Pennsylvania operations being at about 50% to 60% capacity; the cessation of Lake shipments has also caused a large number of the Fairmont, W. Va., mines to close.



The closing of the Lake trade has stiffened up slack prices in all parts of the country. The heavy export business in other lines is also creating a strong bunkering demand which is probably one of the best features of the market. Among the other constructive developments are reports of heavier orders from the railroads, indications that stocks are being cleaned up and a very slight improvement in general manufacturing. Prices are not quotably changed and we continue these on the same basis as for the last several weeks as follows: West Virginia steam, \$2.35@2.55; fair grades, Pennsylvania, \$2.55@2.65; good grades of Pennsylvania, \$2.70@2.80; best Miller Pennsylvania, \$3.10@3.15; Georges Creek, \$3.15@3.25.

Anthracite—The cold snap of two weeks ago started some activity in anthracite, but the recent warm weather has caused a slowing up and the business is scarcely holding its own. Individual operators are curtailing production probably more than is generally known and although the large companies have so far continued on full working schedules, it has been only by a decided effort. Sales agencies are experiencing great difficulty in placing the tonnage and it is understood that the Reading is now putting all of its steam sizes back into storage. If the higher temperature continues much longer a general slump in all directions is inevitable.



The line trade has fallen off sharply but is probably no worse than at Tidewater. The situation on rice and egg coal is somewhat softer than last week while pea coal is difficult to move, either all-rail or at Tidewater. The other sizes are not notably changed from last week, although prices are in some cases lower, the market now being quotable on the following basis:

	Upper Ports		Lower Ports	
	Circular	Individual	Circular	Individual
Broken.....	\$5.10	\$4.60@5.10	\$5.05	\$4.55@5.05
Egg.....	5.35	5.10@5.35	5.30	4.80@5.30
Stove.....	5.35	5.35	5.30	5.30
Chestnut.....	5.60	5.50@5.60	5.55	5.35@5.55
Pea.....	3.55	3.45@3.55	3.50	3.35@3.50
Buckwheat.....	2.80	2.60@2.80	2.50@2.75	2.25@2.75
Rice.....	2.30	2.20@2.30	2.00@2.25	1.40@2.25
Barley.....	1.80	1.70@1.80	1.75	1.25@1.75

PHILADELPHIA

Anthracite market continues to lack tone. Domestic grades fairly active, but small sizes continue to hamper operations. Cold weather will be necessary to inject any snap into trade. Reports in bituminous still adverse.

Anthracite—The past week was anything but favorable to the anthracite business because of the high temperatures. Operations were continued on full time, as a rule, but some of the large companies are hard pressed to dispose of their surplus, especially of the steam sizes. It is a notable fact that the steam sizes are not moving to the extent that is naturally expected at this season of the year, and there is a general complaint in the trade about the poor demand. This is due to the depressed industrial situation, and the exceedingly low prices for bituminous.

Broken coal is not in as good demand as usual while egg is also inclined to drag, substantial concessions from the circular being frequently noted. Stove and chestnut seem to be the only sizes for which there is a ready market; reserve stocks of the latter are still being drawn on to satisfy the demand. Outside of the two last named sizes, the market is simply holding its own.

Prices at Tidewater rule about as follows:

	Circular	Individual
Broken.....	\$4.75	\$4.50 @ 4.60
Egg.....	5.00	4.75 @ 4.85
Stove.....	5.00	5.10
Chestnut.....	5.25	5.25

Bituminous—While there seems to be some slight indications that better conditions are coming, there is nothing to justify this at present time. There does seem to be a better demand, due to the resumption of some manufacturing establishments, but nothing in the way of better prices has been noted, and taking the week as a whole, no improvement can be recorded.

BALTIMORE

The struggle of the coal trade against general adverse business conditions continues. Slack the only branch to show strength. Anthracite business but fair.

The demand is poor in all branches of the bituminous trade. Anthracite dealers are doing a fair early winter business on household business, but the industrial fuel situation fails to show any improvement.

Reports from West Virginia show that prices there, with the exception of slack, have undergone no change. Three-quarter gas was being quoted around 85c. and steam coals at from 85 to 90c. Slack kept advancing all the week, starting

at 45 to 50c. and finally selling around 75c., or on a parity with gas run-of-mine. This was not due so much to any increased demand as to the reduced output.

Pennsylvania coals are without any material change. Lower grades were offering in some small lots at 90c. Better coals sold at from \$1 to \$1.10, while the best grades were moved in restricted lots at from \$1.25 to \$1.35.

HAMPTON ROADS

Shipments only fair. Accumulation in railroad yards about normal. November dumpings lighter than anticipated.

Dumpings over the piers at Tidewater have been about average during the week. There have been some large cargoes exported and also some heavy shipments to the New England market; in addition to this there has been some little movement to Savannah and Tampa. Vessel tonnage has arrived so irregularly that at times some of the piers have been decidedly rushed but at other times there is little or no tonnage alongside the docks. Considering the existing war conditions the number of vessels calling for bunker coal is holding up well.

Prices are generally at the circular with perhaps some cuts being made by shippers who have coal on demurrage. There are indications that some change will be made shortly in the price for bunker coals to be supplied during 1915, but it is impossible to predict what it will be. In the majority of cases payment for bunker coal was made by draft payable in London but the war and money conditions make this impracticable.

Authoritative announcement of destination of vessels is no longer made, but the following have cleared, presumably for the ports noted:

Vessel	Destination	Vessel	Destination
Celia	Iquique	Wascana	Pernambuco and other Brazilian ports
Mar Corusco	Porto Ferrajo, Elba	Sark	La Plata
Highbury	Italian port	Stromboli	Italian ports
Magda	Media Luna, Cuba	Pet. a	Cienfuegos

OCEAN FREIGHTS

Vessels continue scarce with rates high and hardly quotable.

Freight market conditions are practically the same as a week ago—a strong demand for steamers and a scarcity of available boats; under these circumstances it is rather difficult to quote probable freight rates with any degree of certainty. The following is the approximate market though we can then no doubt give you closer quotations:

To	Rate	To	Rate	To	Rate
Havana.....	\$1.75@2.00	Kingston.....	\$1.85@2.00	Tampico.....	\$2.25*
Cardenas††	1.90@2.10	Curacao.....	1.75*	Rio.....	4.80@6.00
Cienfuegos....	2.00@2.25	Santiago.....	2.10@2.25	Buenos Ayres**	4.80@5.76
Port of Spain.	2.25@2.50	Guantanamo.	2.10@2.25	Mediterranean.....	4.80@5.76
St. Lucia.....	2.25@2.50	Demerara.....	3.00*		
St. Thomas...	1.80@2.00	Bermuda.....	2.00@2.25		
Barbados.....	2.25@2.50	Vera Cruz...	2.25*		

*About. †Small boats to Kingston \$2.10@2.25. **Or La Plata. ††Or Sagua. W. W. Battie & Co.'s Coal Trade Freight Report.

COAL CHARTERS

Coal charters have been reported by the "Journal of Commerce" as follows:

Vessel	Nationality	From	To	Tons	Rate
Aurania	Italian	Philadelphia	Mediterranean	2180	
Kronprins Olav	Norwegian	Philadelphia	Havana	2509	
Laura C. Anderson		South Amboy	Jacksonville	766	\$0.90
Florence M. Panley		Philadelphia	Portland	927	
Estelle Krieger		Norfolk	Puerto Cabello	1047	2.50
Modiva	Norwegian	Philadelphia	Sagua	778	
Malcolm Baxter, Jr.		Philadelphia	Boston	1479	0.60
May V. Neville		Norfolk	Texas City	1043	1.05
John B. Manning		Norfolk	Boston	955	
Trento	Italian	Virginia	West Coast Italy	2089	4.80
Daisy Farlin		New York	Macoris	285	

Note—Steamers are indicated by bold face type, all others being schooners.

OHIO VALLEY

PITTSBURGH

Trade suffering severely from cessation of Lake shipments, but otherwise showing slight signs of improvement. Operations at between 35 and 40% of capacity. Slack stiffening, other descriptions being cut as much as formerly, with \$1.15 asked on mine-run for prompt shipment.

The coal trade is naturally suffering severely from the cessation of Lake shipments, but this is the normal experience at this time of the year, and operators are not trying to force the market except in a few instances, when prompt coal is sold at particularly low prices. In other respects the situation

shows some slight signs of improvement. Several large operators report a little increase in requirements under contracts with manufacturers, particularly in the iron and steel trade. The manufacturers have no stocks and seem to be increasing their operations slightly. Domestic demand increased somewhat last week, but a further and much larger increase is expected. The retail dealers have been buying strictly from hand to mouth, and the advent of really cold weather, after an exceptionally temperate fall, should result instantly in considerably larger demand upon the mines.

With the restriction due to the cessation of Lake shipments, operations have been further reduced in the Pittsburgh district in the past fortnight, and are now at not over 40% at the outside, though they probably average well above 30%. While little increase is expected for the near future, a rate of 50% may possibly be reached by the end of the month.

There are no contract prices being quoted, as there is no contract demand. For prompt lots most sellers are holding rather firmly, but there are cut prices enough to cover most of the demand. Slack has continued to firm up, and is now quotable at 70@80c., though by this time of the year it is usually up to the regular winter level. The leading interest in the district adheres to its quotation of 90c., and would probably buy slack if low prices were quoted. We quote the market approximately as follows, noting that except in the case of slack the prices are frequently shaded: Slack, 70@80c.; nut and slack, \$1; nut, \$1.10; mine-run, \$1.15; ¾-in., \$1.25; 1¼-in., \$1.35.

BUFFALO

An increased activity in bituminous, especially slack. General improvement anticipated. Canada doing better. Lake trade closing. Anthracite strong.

Bituminous—There is a better feeling in the trade, though the demand has not improved as yet. Some shippers are finding better conditions and there is a general disposition to hold firmer and to ask a little more for slack. There are not so many records of slack selling at sacrifice prices and it is generally believed that it will advance before long. An adverse feature of the slack situation is that screenings are dull, selling at about \$2, which brings them in competition with slack.

There is a small stir in the Canadian trade, due to the starting up of factories on orders for war munitions from England. In fact orders from Europe are becoming general everywhere and factories are also beginning to make goods formerly imported. All indications now point to a gradual return to normal conditions, though it may be some time before the effects are felt in the coal trade. The current market is certainly in better condition than it has been of late, not much coal being on car service and fewer reports of very low prices being heard.

The closing of the Lake trade affects the bituminous market in a general way. Other markets are compelled to absorb the great volume going out by Lake, but this is usually discounted to a certain extent. Sometimes this is even overdone to such an extent that with the regular increase of consumption at this time of the year, the supply runs short.

Prices are a little stronger, especially for slack, quotations remaining at \$2.80 for Pittsburgh lump, \$2.70 for three-quarter, \$2.55 for mine-run and \$2.15 for slack. Allegheny Valley coal sells at 25c. below Pittsburgh.

Anthracite—There is a good movement of all sizes of anthracite except egg, which has to be forced by refusing orders for stove or chestnut unless some egg is included. But it is believed that it will all be taken up as the late cold snap has improved the retail trade and the rail-line movement has all along been good. Lake shippers are holding on yet and are willing to pay extra insurance on a few cargoes. Shipments for the week were 146,500 tons, nearly all of it going to the heads of Lakes Superior and Michigan. As a rule the shippers are well supplied at that end of the Lakes.

TOLEDO

Lake movement practically at an end. Many vessels have gone into winter quarters at Toledo. Weather conditions affect market.

While the volume of coal passing through Toledo has been heavier than usual, business has been no comparison to what was expected. The official navigation season on the Lakes ended last Monday at midnight. Underwriters have announced that there will be no extension of insurance this year although this has not been the case in former seasons; so few vessels are out that the possible loss of even one steamer would wipe out any profit that might be made. Three vessels only are in sight for loading at the Toledo docks. Twenty-three Lake freighters are now in winter quarters here and 17 are being stored in the Bay View park harbor.

COLUMBUS

Some improvement is noted as a result of the more favorable weather and the bettering in general trade conditions. Production slightly increased and prices steadier.

While the freezing weather of a week ago was only of a few days' duration, it stimulated trade to a certain extent. Dealers placed orders for immediate delivery while buying on the part of consumers was more lively and a better tone was noted on all sides.

Steam business is still slow and prices rather weak due to the fact that West Virginia coal is being sold under the Ohio circular. Railroads are taking only a minimum amount of fuel though some show a disposition to stock up for the winter season.

Domestic trade is the strongest point in the market. Rural dealers are buying more freely since farmers are now taking time to haul their coal supply. Householders are also buying more freely. The new retail prices of Nov. 1 have been generally well maintained although there is no likelihood of another advance soon. Retailers' stocks are lower than for some time.

Production in Ohio has increased slightly under the beneficial effect of lower temperatures. The Hocking Valley produced about 60% of normal during the week. Crooksville and Cambridge also outputted a like percentage while the Jackson field is credited with 50%. In the Pomeroy Bend district, production is almost normal.

Prices in the Ohio fields are:

	Hocking Valley	Pomeroy	Kanawha
Rescreened lump.....	\$1.55	\$1.65	.....
Inch and a quarter.....	1.50	1.55	\$1.40
Three-quarter inch.....	1.35	1.40	1.35
Nut.....	1.15	1.25	1.15
Mine-run.....	1.10	1.15	1.10
Nut, pea and slack.....	0.40	0.45	0.40
Coarse slack.....	0.30	0.35	0.30

CINCINNATI

Milder weather has cut down the domestic demand, but the steam business is improving. Prices steady.

The weather has again turned abnormally mild and domestic business has dropped off accordingly. But the previous cold spell showed both consumers and retailers the danger of short stocks, and while the movement of prepared sizes is now below what it was ten days ago, it is much better than before that time. Operators are no longer hampered by an inability to move domestic coal and screenings and steam coal are also in good demand; the steam demand is steadily improving, with every indication of reaching a high point by Jan. 1. During this month many large consumers are expected to make arrangements for their 1915 fuel supply, and business should experience a beneficial effect from this. Prices are steady, the cheaper grades being especially strong.

CLEVELAND

Warm weather and the reconsigning of Lake coal left over on the docks have made the spot market weak. Some demurrage coal noted. Slack stiffening up.

Receipts of coal have not been any heavier, but the warm weather has had a depressing effect upon the buyers. Coal on track has gone on car service and fine coal was sold at from 5 to 15c. below shipment prices. Hocking and Goshen nut and slack went as bonus, \$1.55 on track here, while Youghiogheny, Panhandle, Fairmount and other high-grade steam coals touched \$1.60 to \$1.65. A considerable amount of fine coal has gone on car service and it seems now as if there would be little chance of the market cleaning up this week.

The domestic trade is not absorbing all the coal sent here. Pocahontas lump was offered at \$3.45 to \$3.50 and mine-run was shaded 5 to 10c. from shipment quotations. There has been some No. 8 from West Virginia consigned here; it is exclusively three-quarter and is being offered at almost any price. Three-quarter coal left over after the last ships were loaded Monday was sold at low prices and reconsigned to Western trade.

A further weakening factor is the excessive production of three-quarter coal to get slack. The closing of the Lake trade is causing slack to advance and is the reason for operators trying to substitute mine-run coal for fine coal. Slack will advance to the mine-run price before another week. Quotations for shipment are as follows:

	Pocahontas	Youghiogheny	Bergholz	Fairmount	W. Va. No. 8
Lump.....	\$3.60	.....	\$2.45	.....	.....
Lump, 6 in.....	.....	.....	.....	.....	.....
Egg.....	3.60	.....	.....	.....	.....
Egg, 6 in.....	.....	.....	2.10	.....	.....
Lump, 1½ in.....	.....	\$2.40	2.25	.....	.....
Lump, 1 in.....	.....	2.30	2.10	\$1.95@2.00	\$1.95@2.00
Mine run.....	2.60	2.25	1.95	1.85@1.90	1.90
Slack.....	2.40	1.75@1.80	1.65@1.70	1.75@1.80	1.75

COKE

CONNELLSVILLE

Heavy inquiry for furnace coke for 1915 delivery, owing to recent sales of pig-iron and expiration of existing contracts. One contract closed on sliding scale and others being negotiated on this basis. No immediate prospect of increased consumption or production.

The contract furnace coke market has suddenly taken on an aspect of great activity. Inquiries for contracts for delivery during part, or all of next year, received in the past ten days are easily larger than the total of inquiry for several months preceding, and at least one contract has actually been closed.

The suddenly increased inquiry is generally attributed to the greater activity in the pig-iron market. The Buffalo furnaces have lately made a drive and by naming very close prices have sold a quarter of a million tons or more of pig-iron, while other districts have increased their sales somewhat. It is everywhere recognized that the uncertainties of the future are such that no producer can afford to risk selling his finished product without at once covering the raw material involved.

A contract was closed a few days ago for 10,000 to 12,000 tons of furnace coke monthly during the first half of 1915, on a sliding scale, the price to be adjusted monthly according to the ruling price of pig-iron, and it is understood the minimum price stipulated for coke in the contract is but little under \$1.75. The inquiries number eight or ten, involving 80,000 to 90,000 tons of coke a month. Most of this is for the first half of next year, no inquiry being for the first quarter only, while one or two are for the whole year and one inquiry involves coke for two years. The trend is stronger than usual towards the making of sliding scale contracts.

The demand for prompt furnace coke increased somewhat last week, owing probably to the holiday, and \$1.60 was obtained with less difficulty than usual. Foundry coke remains very quiet.

The activity in the coke market is attributable entirely to the desire of furnacemen to cover for next year, their present contracts expiring in almost all cases with this month. There is no immediate prospect of increased consumption or production. The market stands quotable approximately as follows: Prompt furnace, \$1.60; contract furnace, \$1.75; prompt foundry, \$2@2.25; contract foundry (nominal) \$2.35@2.50, per net ton at ovens.

The "Courier" reports production in the Connellsville and lower Connellsville region in the week ended Nov. 21, at 200,804 tons, a decrease of 5510 tons, and shipments at 200,022 tons, a decrease of 10,305 tons.

BUFFALO

Some improvement in inquiries, but no stir yet.

Here and there a coke shipper reports that he has a few more consumers asking for prices, but the improvement is not of much account and may not go any further for the present. Prices remain on the basis of \$4.25 for best 72-hr. Connellsville foundry and \$3.30 for stock coke.

ST. LOUIS

The market is quiet on foundry coke, with little demand. In the past week there have been a few inquiries for the coming 12 months, on selected 72-hr.; quotations were \$2.50 at the ovens. This coke takes a \$2.80 rate to St. Louis.

A very limited tonnage of byproduct is moving in, whereas in former years the local domestic coke was principally byproduct. This year it has been supplanted by coke from the local gas house, which retails at \$5.75, and is sold to the dealer at \$4 f.o.b. his tracks.

CHICAGO

There is a little better inquiry for furnace and foundry coke, but purchasers are seemingly indisposed to give orders at the prices quoted, which are as follows: Byproduct, \$4.95; Connellsville, \$4.75@4.90; Wise County 72-hr. (select), \$4.75; gas coke, \$4.25; furnace coke, \$4.40@4.65.

THE STEEL INDUSTRY

The buying movement in pig-iron, which started with large contracts at Buffalo, as reported last week, has extended to other districts. Cleveland, Pittsburgh, Cincinnati, Chicago and St. Louis in particular have participated. At the same time there are signs in the finished steel trade pointing to considerable activity in December, making that the best month in the final quarter, in point of tonnage.—"The Iron Age."

SOUTHERN

BIRMINGHAM

Coal market remains quiet, though past few days have brought out more inquiries for lump.

The coal market in this district remains about stationary. There is little demand for either steam or lump coal, though the past few days, has brought cooler weather which has helped the retail dealers to some extent. However, it will take at least two weeks of cold weather to reduce the stocks sufficiently to effect the operators. Steam fuel is in a little better shape than lump coal. The demand is practically nothing, except on the regular contracts. Some of the mines are closed down entirely, while others are running from two to three days per week. No decided improvement is looked for until the first of the year.

LOUISVILLE

Prices considerably off the season's basis. Much coal on demurrage.

Continued unseasonable weather has caused a slack demand, though there are occasional reports of some increased activity in certain sections. Prolonged cold weather will be necessary to stimulate business to any extent.

Steam coals are dull; there is much fuel on demurrage in practically all of the centers to which the Kentucky operators ship. The cheaper grades are a drug on the market and many operators with poor selling facilities are continuing to give their coal away. It is reported that one Louisville operator sold a full car of eastern Kentucky nut and slack, at the mines, for \$4.65, or at the rate of 10c. a ton. Prices are running considerably less than normal, from 25 or even 60c. below what is ordinarily the case at this season. Western Kentucky lump is offered at \$1, nut and slack at about 55 to 65c. Eastern Kentucky, highest grade block ranges from \$1.60 to \$1.75, run-of-mine, \$1.25 to \$1.35, with nut and slack from 60@75c. down, according to grade and character. All prices f.o.b. mines.

MIDDLE WESTERN

CHICAGO

Situation more hopeful with some improvement noted. Continued strength in screenings. Anthracite trade improved. Pocahontas weak. Indiana and Illinois coals firmly held.

The colder weather of last week gave a better tone to the market with brighter prospects for the future. The temperature is again higher, but wholesalers and jobbers report a continuance of inquiries and a number of rush orders are being filled. It is evident that the consumers have been backward in stocking fuel this year. Very little consignment coal is left on tracks drawing demurrage. There is a widespread feeling that the balance of the winter is going to see steady absorption of the normal production of the mines.

Operators who have not attempted to force the market seem to be fairly well satisfied. Some companies are now working full time, but others have not developed a sufficient amount of business to justify such a course. During the last ten days, yard stocks have been materially reduced, and orders are now for immediate shipment.

The improvement in screenings continues. Many factories and industrial plants have either resumed operations or increased their working forces. Steam coal prices have advanced from 10c. to 15c. per ton, and show a further tendency to harden.

The anthracite demand has been urgent, and prices firm. Chestnut is short, egg in over-supply, and stove normal.

Shipments of egg and nut from Franklin County are holding up well, with most mines on practically full running schedules. Screenings are strong and in short supply, which is unusual in view of the heavy movement of lump.

Indiana operators are disposing of their lump coal locally and little reaches the Chicago market. Shipments on contracts are heavy. Indiana screenings are strong.

Smokeless has shown some improvement; lump and egg are short and prices slightly stronger.

The accumulations of Hocking coals have been cleaned up and shipments increased.

Carterville mines are working full time, leading all other Illinois districts in this respect; the demand is satisfactory and no low prices are quoted.

Demand is strong in the Springfield district; circular prices are strictly adhered to and screenings are buoyant; Prevailing quotations are as follows:

	Franklin Co.	Springfield	Harrisburg	Sullivan	Clinton
Lump.....	\$1.65@2.00	\$1.60	\$1.50@1.75	\$1.60@1.75	\$1.65@1.75
4-in. lump.....					
Steam lump.....				1.50	1.15@1.20
24-in. lump.....				1.20@1.35	
12-in. lump.....			1.20@1.30		1.10
Mine-run.....			1.50@1.75		
Egg.....	1.50@1.75				
6x3-in. egg.....		1.50			
Nut.....		1.35	1.40@1.75		
No. 1 nut.....	1.50@1.75				
Screenings.....	0.65@0.75	0.60@0.70	0.55@0.75	0.60@0.75	0.60@0.75

Hocking Valley 1 1/4-in. lump, \$1.40@1.60; mine-run, \$1.25. New River and Pocahontas lump and egg, \$2.25; mine-run, \$1.25@1.40.

Somerset Smokeless lump and egg, \$2@2.25; mine-run, \$1.25@1.40.

Cartersville lump, \$1.60@1.75; 6x3-in. egg, \$1.60@1.75; No. 1 washed egg, \$1.60@1.75; No. 2 washed egg, \$1.50@1.60.

Green County 5-in. lump, \$1.50@1.65; 3-in. lump, \$1.30@1.40; 3-in. egg, \$1.30; mine-run, \$1.10.

INDIANAPOLIS

Mild weather has resulted in a limited demand for domestic lump. Some improvements in slack. Mines on better running time. Slow growth in industrial demand.

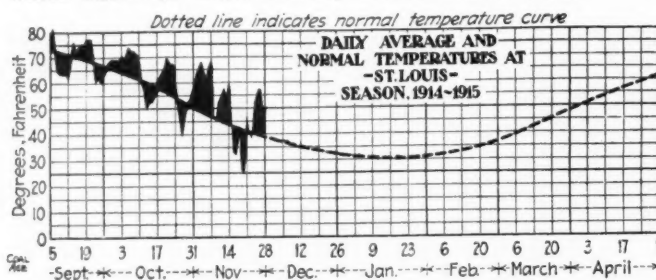
The mines seem to be making better time. The cold snap of last week cleaned up the surplus slack and left the mines in position to increase operations. The price in the open market is 50 to 60c., which, at some mines is an advance of 10c. The railroad demand is still below normal for the season. A slightly improved industrial situation has something to do with the better movement of screenings; a slow improvement is expected in this direction.

A campaign has been started to eliminate the various grades of slack and return to one size of screenings. The agitation has been brought about largely by the experience of operators this year in having to find a market for the smaller sizes at the lowest prices in the history of the Indiana coal industry.

ST. LOUIS

Prices stiffening and a better tone is evident. December outlook fair. Collections the worst in years.

A slight change for the better, as regards high-grade coal, is noted in the local market. With practically no demand at all for domestic coal, there has been a stiffening up of prices on the lump size, while egg seems to hold its own. Raw and washed nut are unchanged and there is nothing to indicate an advance, except on the smaller sizes of washed coal for steam purposes; these are likely to increase with screenings which figure quite prominently in the market now.



On a contract for screenings from the Cartersville field, from now until Apr. 1, several operators bid 80c. The stiffening up of the market is due to several mines in the Williamson and Franklin County field having decided to curtail their output. In the Standard field coal continues to sell below the cost of production.

Anthracite coal is heavy, with no demand, and smokeless the same. The retailers all report business slow but steady. Collections both retail and wholesale are the worst in years.

The prevailing wholesale prices are:

	Williamson and Franklin Co.	Big Muddy	Mt. Olive	Standard	Sparta
2-in. lump.....			\$1.25	\$1.05@1.10	\$1.20
3-in. lump.....			1.40		
6-in. lump.....	\$1.35@1.60		1.50	1.25@1.35	1.40
Lump and egg.....	1.85@2.15	\$2.25			1.35
No. 1 nut.....	1.25@1.40			0.75	
Screenings.....	0.50@0.55		0.80@0.85	0.25@0.30	0.20
Mine-run.....	1.05@1.10			0.75@0.80	
No. 1 washed nut.....	1.50@1.60	2.00	1.60		
No. 2 washed nut.....	1.30@1.40		1.45		
No. 3 washed nut.....	1.10@1.15				
No. 4 washed nut.....	1.00@1.10				
No. 5 washed nut.....	0.25@0.30				

PORTLAND

Buying in a hand-to-mouth fashion. Volume of business so far only about 40% normal.

While there was a small spurt for a few days during the cool weather, orders are falling off again. Consumers are apparently buying from hand to mouth, and will continue to do so for the winter. This will probably mean that the first real cold spell will find the dealers snowed under with urgent orders that they will find difficulty in filling promptly. Importations of coal are light at present as a result, and dealers have large stocks on hand.

PRODUCTION AND TRANSPORTATION STATISTICS

BALTIMORE & OHIO

The following is a statement of coal and coke tonnage moved over this system and affiliated lines during August, September and October of this year and last year:

	August		September		October	
	1914	1913	1914	1913	1914	1913
Coal.....	2,769,453	3,295,123	2,878,963	3,001,733	2,662,377	3,250,220
Coke.....	242,283	391,999	237,661	387,704	208,866	388,337
Total.....	3,011,736	3,687,122	3,116,624	3,389,437	2,871,243	3,638,557

NORFOLK & WESTERN RY.

The following is a statement of coal handled by the N. & W. Ry. during October and the past four months of the current year in short tons:

	July	August	Sept.	October
Pocahontas Field.....	1,314,478	1,277,621	1,390,531	1,021,699
Tug River District.....	263,240	293,179	295,332	270,651
Thacker District.....	288,643	286,572	295,776	264,528
Kenova District.....	100,600	105,724	110,158	112,455
Cinch Valley District.....	140,751	134,408	158,393	84,530
Other N. & W. Territory.....	2,735	4,211	4,781	4,860
Total N. & W. Fields.....	2,110,447	2,101,715	2,254,971	1,758,723
Williamson & Pond Creek R.R.....	90,819	91,813	85,053	70,338
All other railroads.....	301,796	257,280	169,892	168,778
Grand total.....	2,503,062	2,450,808	2,509,916	1,997,839

FOREIGN MARKETS

GREAT BRITAIN

Exports—British exports for October and the first ten months of the past three years were as follows:

To	October		Ten Months			
	1912	1913	1914	1912	1913	1914
Russia.....	520,800	756,112	19,107	3,628,685	5,218,772	3,086,032
Sweden.....	500,925	503,863	525,357	3,339,161	3,779,014	3,580,692
Norway.....	209,015	200,079	197,813	1,755,010	1,888,628	2,104,903
Denmark.....	274,656	281,369	313,873	2,235,248	2,494,585	2,581,185
Germany.....	876,134	835,839		6,915,448	7,619,413	5,256,765
Netherlands.....	226,419	167,299	108,851	1,575,330	1,712,193	1,565,953
Belgium.....	188,661	181,591	82,148	1,249,483	1,728,225	1,166,549
France.....	985,570	1,077,519	1,006,066	8,173,434	10,644,929	10,046,810
Portugal ¹	138,330	94,748	65,434	1,000,329	1,124,872	988,620
Spain and Canaries.....	374,674	328,971	200,708	2,767,978	3,074,153	2,659,286
Italy.....	1,027,991	910,513	705,346	7,481,586	8,060,538	7,262,616
Austria.....						
Hungary.....	62,264	103,433		613,316	899,840	564,362
Greece.....	42,311	84,033	20,632	498,227	591,284	510,380
Roumania.....	21,192	47,864		185,500	197,381	218,218
Turkey.....	32,351	61,728	12,069	342,377	246,682	429,506
Egypt ²	232,621	229,100	167,770	2,382,127	2,488,330	2,361,658
Algeria.....	120,766	108,422	31,896	829,169	1,060,663	812,523
Portuguese W. Africa.....	32,358	10,908	4,166	254,355	200,990	157,452
Chile.....	13,373	35,310	10,382	492,090	492,951	370,773
Brazil.....	167,173	147,943	71,596	1,290,323	1,593,692	1,038,214
Uruguay.....	96,312	33,612	46,143	719,298	601,754	526,665
Argentina.....						
Republic.....	424,219	297,148	173,068	2,694,002	3,022,451	2,535,790
Channel Is.....	19,141	14,726	12,317	147,509	136,559	139,540
Gibraltar.....	24,635	25,311	15,116	275,668	280,102	254,322
Malta.....	59,791	42,068	13,193	328,295	548,429	324,234
Aden and dependencies.....						
British India.....	15,714	20,881	16,967	164,992	148,559	135,817
Ceylon.....	17,288	14,216	12,523	112,889	140,048	139,784
Other countries.....	10,881	23,764	16,834	194,042	198,122	239,871
Totals.....	84,213	101,103	95,122	904,320	1,064,102	1,002,326
Coke.....	122,298	150,955	150,879	803,011	989,010	975,204
Briquettes.....	136,376	169,500	56,005	1,252,007	1,711,865	1,487,943
Total.....	7,058,442	7,059,928	4,151,381	54,605,209	63,958,136	54,523,993
Bunker.....	1,818,431	1,888,794	1,455,447	15,020,522	17,434,411	16,037,409

¹ Includes Azores and Madeira ² Including Anglo-Egyptian Sudan.

Nov. 23—Business is still suffering owing to scarcity of tonnage. Stocks of large coals are excessive and buyers in a position to take immediate delivery can obtain concessions in quoted prices. Quotations are approximately as follows:

Best Welsh steam.....	\$4.80@5.28	Best Monmouthshires....	\$3.96@4.08
Best seconds.....	4.32@4.56	Seconds.....	3.84@3.96
Seconds.....	4.14@4.26	Best Cardiff smalls.....	2.04@2.16
Best dry coals.....	4.56@4.80	Cargo smalls.....	1.20@1.68

The prices for Cardiff coals are f.o.b. Cardiff, Penarth or Barry, while those for Monmouthshire descriptions are f.o.b. Newport; both net, exclusive of wharfage, and for cash payment.

Freights—The position remains the same. Chartering orders numerous but tonnage scarce. Rates are approximately as follows:

Gibraltar.....	\$2.64	Venice, Ancona....	\$4.80	Singapore.....	\$4.32
Malta.....	2.88	Alexandria.....	4.08	Las Palmas.....	2.64
Marseille.....	3.66	Port Said.....	4.08	St. Vincent.....	2.76
Algiers.....	4.14	Aden.....	4.08	Rio Janeiro.....	3.84
Genoa, Savona....	3.48	Colombo.....	4.20	Monte Video....	3.36
Naples.....	3.48	Sabang.....	4.08	Buenos Ayres....	3.60

Note—These indications are for Bristol Channel loading. Rates from the East Coast of England are considerably higher.

SPANISH IMPORTS

The Spanish imports of coal for the nine months to Oct. 1, of the current year, were 2,018,943 tons, as compared with 2,029,846 tons for the same period in 1913. Coke imports for the same periods were, respectively, 294,460 tons, in 1914, and 273,160 tons in 1913.

GERMANY

Considerable demand in the North to replace British coal. Heavy movement from Upper Silesia to Austria-Hungary. Belgium mines resuming operation.

Northwestern Bohemia—Although the output has been good, it is still far from normal, the car supply being about 50%. In household sizes there has been a marked falling off in the supply.

Saxony—Deliveries have shown a distinct improvement. The demand for soft coal is particularly urgent from the North, especially Hamburg, in consequence of the loss of the usual English supplies. Moreover, some industries, busy with military products, are buying heavily.

Upper Silesia—Coal shipments from this district to Austria-Hungary average 700 cars daily, of which 200 are for Vienna. The operators have promised to increase this to 1000 cars daily, if the requisite cars are furnished the Upper Rhine. The demand for steam sizes keeps brisk.

Belgium—The mines have been opened at Charleroi; about 60% of the regular force is employed.

Essen—The Syndicate has been ordered to increase the coal output to 60%, coke 27½%. The Syndicate agreement will expire Dec. 31, 1915, but negotiations have been pending for some time for the renewal of the agreement until 1921. The war stopped the negotiations and a temporary agreement is now under consideration to restrict all independent sales until 1915. As there is no disposition to dissolve the syndicate and as all wish to avoid industrial conflicts, a general acquiescence is looked for.

Coal Contracts Pending

Contract No. 14—Panama, C. Z.—In the list of bids quoted on this contract in last week's issue, the price of the West Virginia Coal Co. for 150,000 tons should have been \$2.83 instead of \$2.38, as noted. Delivery at Newport News and Seawalls points.

Contract No. 17—New York—Bids received on this contract (see "Coal Age" issue of Nov. 21), for furnishing the Department of Public Charities with coal, were as follows:

MANHATTAN (anthracite)—1800 tons egg, Pattison & Bowns, \$5.37; 900 tons stove, Gavin Rowe, \$5.70; 7000 tons buckwheat No. 1, Pattison & Bowns, \$2.79; 800 tons pea (L. H.), Meyer-Denker-Sinram Co., \$4.85; 30 tons egg coal (B. T. C.), Meyer-Denker-Sinram Co., \$7.40.

MANHATTAN (bituminous)—10,000 tons, Geo. D. Harris & Co., \$2.87; 400 tons gas coal, John W. Peale, \$3.45.

BROOKLYN (anthracite)—7000 tons pea, Bacon Coal Co., \$4.62; 700 tons stove, Bacon Coal Co., \$6.81.

RICHMOND (anthracite)—400 tons egg, Gavin Rowe, \$6.17; 250 tons stove, John E. Donovan, \$6.43; 6000 tons buckwheat No. 1, Joseph Johnson's Sons, \$3.38.

Address, Contract Clerk, Department of Public Charities, Room 1034, Municipal Building, Borough of Manhattan.

Contract No. 20—New York—Bids will be received by the Board of Trustees, Bellevue Hospital, until 3 p.m., Dec. 4, for furnishing and delivering 300 gross tons buckwheat coal No. 1. The security required will be 30% of the total amount of the bid and a deposit of 1½% shall accompany each bid. The time for completion of this contract shall not be later than Dec. 31. Blank forms and further information can be obtained on application to the auditor, 400 East 29th St., Borough of Manhattan.

Contract No. 21—Cleveland, Ohio—Sealed proposals for furnishing and delivering 2000 tons of Pittsburgh nut coal, 100 tons of the best grade soft lump coal and 50 tons of the best grade Lackawanna egg coal will be received by the County Commissioner until 10 a.m., Dec. 12, each bid to be accompanied by samples of not less than 25 lb. A certified check for \$500 must accompany each bid. Address E. G. Krause, Clerk of the Board of County Commissioners, Cuyahoga County, Cleveland, Ohio.

Contract No. 22—Philadelphia—Sealed proposals for furnishing anthracite coal of various sizes to the different departments of the city will be received until Dec. 16. Deliveries are to be made as per specifications. Address, Director of Supplies, Room 312, City Hall, Philadelphia, Penn.

Contract No. 23—Boston, Mass.—Proposals will be received until noon, Dec. 4, for furnishing the Boston & Maine R.R. with 25,000 gross tons of low volatile coal for power house use. Mine-run coal is required, and it should be low in sulphur and have a heat value of approximately 14,000 to 15,000 B.t.u. Shipments will be in cargo lots, evenly distributed throughout the year, beginning Jan. 1, 1915, alongside Mystic Wharf, Boston, Mass. Address, Benjamin S. Hinckley, Purchasing Agent, North Station, Boston, Mass.

Contract No. 24—U. S. Navy—Only a comparatively few bids were received in reply to the recent request for tenders for coaling naval vessels at 82 different ports, the following being the complete list, all quotations f.o.b.:

BAKER, WHITELEY COAL CO. (Baltimore)—Bergen, \$8.41; Gravesend, \$6.67; Mauretius, \$12.62.

CHESAPEAKE & OHIO COAL AGENCY CO. (Boston)—Gravesend, \$6.61.

BERWIND WHITE COAL MINING CO. (New York)—Curacao, \$5.40 (trimmed); Havana, \$5.80; Manzanillo, \$12.50 (trimmed); Naples, \$6.48.

CASTNER, CURRAN & BULLITT (Philadelphia)—Curacao, \$5.28 (trimmed alongside wharf).

W. R. GRACE & CO. (New York)—Callao, \$13.70; Valparaiso, \$17.49.

PAPARAO COAL MINING CO. (Wellington, N. Z.)—Auckland, N. Z., \$6; Wellington, N. Z., \$5.40.

PORTO RICO COAL CO. (New York)—San Juan, \$6.20.

VICTORIA COAL MINING CO. (New York)—Bergen, \$8.34; Mauretius, \$12.48.

WITTENBERG COAL CO. (New York)—Bergen, \$8.34; Mauretius, \$12.48.

WILLARD BROS. (New York)—Amsterdam or Rotterdam, \$4.56; Bermuda, \$9.24.

Address, Paymaster General, U. S. N., Navy Department, Washington, D. C.

CONTRACTS LET

Contract No. 13—New York—This contract, previous notices of which, including most of the bids of various companies, appeared in this column, has been awarded as follows: Smith, Lineaweaver & Co., 14,000 tons No. 1 buckwheat at \$3.19; John W. Peale & Co., 3700 tons No. 1 buckwheat at \$3.67, and 15,000 semi-bituminous run-of-mine at \$3.35; Joseph Johnson's Sons, 4000 tons No. 1 buckwheat at \$3.30; Pattison & Bowns, 3800 tons No. 3 buckwheat at \$1.97. Address William Williams, Commissioner, Department of Water Supply, Gas and Electricity, Room 2351, Municipal Building, Borough of Manhattan, City of New York.

Contract No. 16—New York Harbor—The bid of Hite & Rafetto has now been definitely accepted on this contract, which provides for furnishing and trimming approximately 17,000 tons of bituminous coal to be used by the United States dredges in New York Harbor. This bid was \$3.43 per ton for Bird Quemahoning coal with a guaranteed heat value of 14,400 B.t.u. Maj. G. J. Dent, Corps of Engineers, Army Building, New York.

Contract No. 18—Brooklyn—The bids on this contract, which provides for furnishing 560,000 lb. of anthracite pea coal to the 26th Ward Disposal Works, at the foot of Hendrix St., Brooklyn, were as follows on a basis of 1000 lb., delivered: Bacon Coal Co., \$2.24; Miners' Coal Co., \$2.50; Wood's Sons & Co., \$2.73. For previous notice on this contract see "Coal Age," issue of Nov. 21. Address, Bureau of Public Buildings and Offices, Borough of Brooklyn, Room 1003, No. 50 Court St.

Financial Department

Pond Creek Coal Co.

(Continued from p. 656)

New Stock—To preserve our working capital, 6333 shares of common stock were issued and offered to common stockholders at \$50 per share.

Net Current Assets—These increased \$54,759, to \$1,445,897.

Additions to Property Account—Such additions in 1913 include the completion of the dock at Duluth, the addition of boilers and automobile stokers to the power plant at Holden; two fan houses, a sub-station, two 15-ton and six 6-ton electric locomotives, 200 steel mine cars, etc.

Legislation—In W. Va. a workmen's compensation Act took effect Oct. 1, 1913, and a state workman's compensation fund was established, to which it seemed proper that the company should become a contributor.

Outlook—Conditions for a favorable year's business appear encouraging.

CONSOLIDATED EARNINGS STATEMENT YEARS ENDING DEC. 31

	1913	1912		1913	1912
Net earnings.....	\$800,448	\$811,048	Add—Int. on bank deposits, etc.....	\$5,663	\$18,694
Res. for extinguishment and depreciation.....	106,047	95,357	Total net profits..	\$629,672	\$677,132
Net profits.....	\$694,401	\$715,691	Pref'd dividends...	\$298,754	\$298,659
Admin. & gen. exp.	70,392	57,253	Common dividend.	530,943	401,280
	\$624,009	\$658,438	Balance, deficit....	\$200,025	\$22,807

CONSOLIDATED BALANCE SHEET DEC. 31 (INCL. SUBSID'S)

Assets—	1913	1912	Liabilities—	1913	1912
Property account..	5,094,241	5,001,858	Stock (not par—see below).....	\$4,493,974	4,487,016
Bond redemp. fund	3,150	3,150	Cap.stk.of U.S.C. & Oil Co. not held	15,325	15,950
Cash.....	731,787	802,156	Def.pay'ts on prop.	100,125	121,640
Accounts receiv'ble	426,504	446,218	Current liabilities.	\$150,274	185,730
Coal in transit and storage.....	299,421	164,793	Div. paid in Jan...	74,691	74,680
Materials & sup'ls.	299,421	164,793	Prem. on shares of common stock...	692,651	292,334
Unexp. insur., pre-paid taxes, etc...	32,771	22,383	Deprec., &c., funds	510,385	455,062
			Undiv. surp. of sub cos. applicable to stocks not owned.	1,653	3,557
			Surplus.....	848,796	1,048,829
Total.....	6,797,874	6,675,789	Total.....	6,797,874	6,675,789

*Includes 49,796^{7/13} shares preferred and 99,592^{11/18} shares common issued for cash, par value \$12,299; total, \$4,493,974.

†Current liabilities include bonds called for payment, unredeemed, \$3150; accounts payable, \$83,429; accrued payrolls, \$24,700; drafts in transit, \$12,419; accrued taxes, \$26,575.

Note—For last previous annual report of this company see, "Coal Age," Vol. 3, p. 980.

Elk Horn Fuel Co.

An official statement of this company to the first of the current year says:

Organization—Property—Incorporated in West Virginia, Feb. 3, 1913, and its assets consist principally of coal lands; in addition to these, it owns \$4,371,500 par value of stock of the Consolidation Coal Co. The Elkhorn Fuel Co. is not and does not contemplate being a coal-operating company. Its coal land holdings are all located in the eastern part of Kentucky, except some 15,000 acres in Randolph and Upshur Counties of West Virginia.

These lands can be more or less arbitrarily designated as follows (in acres): Mineral fuel, 4500; Beaver Creek, 124,883; Licking River, 47,481; Johns Creek, 21,658; Knott County, 6613; Kentucky River, 45,800; Rich Mountain (W. Va.), 14,600; total, 265,535; Beaver lands under option, 50,000; total owned and under option, 315,535.

The mineral fuel lands are located within what is considered as the best development of the Elkhorn seam of coal and which is now operated by the Elk Horn Mining Corporation. The Beaver Creek lands include the larger part of what is known as the Elk Horn coking coal region. It has been fully prospected and in part developed and operated by the Elk Horn Mining Corporation. These lands contain several seams of coal, principal among which is the Elk Horn seam,

which has shown such superior qualities and uniformity in the Consolidation Coal Co. property which adjoins these lands to the south.

The Licking River lands are located principally in Magoffin County, Ky., on the headquarters of Licking River, and we believe to a large extent contain noncoking coal applicable as steam and domestic coals. The Johns Creek lands are located in Pike County, Ky., principally on the waters of Johns Creek; these coals are noncoking in character, but of excellent quality, and should be readily sold as domestic and steam coal in the West.

The Knott County lands practically adjoin the Beaver Creek lands on the south and contain the Elk Horn seam of coal of equal quality to that of the Beaver Creek lands. The Kentucky River lands are scattered over a wide area on the waters of Kentucky River. They are well within the coal-bearing area, but have not been sufficiently prospected for an estimate of quantity or quality of coal; none of them carries the Elk Horn seam of coal in known workable thickness, but several seams higher in the series show promise of good coal areas.

The Rich Mountain lands in West Virginia contain two coal seams of the so called New River series that have been fairly prospected and operated to some extent. The seams are thin, but contain an excellent quality of coal, particularly adapted for smelting purposes.

The Beaver Creek lands, under option, are a western extension of the Beaver Creek lands owned, and limits the Elk Horn coking coal region on the north and west. These lands contain workable coal seams, but it is probable that those of the northern part of the field are not of a coking type. Our option on the 50,000 acres does not expire until Apr. 30, 1918, and if advantage is taken of the option it will be purchased free of all taxes and other expenses that might be incurred in the meantime.

Leases—The Elk Horn Fuel Co. has leased to the Elk Horn Mining Corporation 24,500 acres of land, 20,000 acres of which are in the Beaver Creek lands and 4500 acres on Boone Fork of Kentucky River. The latter company is rapidly equipping itself to a capacity of 3,000,000 tons of coal per year, 2,000,000 tons of which are tributary to the Chesapeake & Ohio Ry. and 1,000,000 tons to the Louisville & Nashville R.R. This lease, with others which the Elk Horn Fuel Co. has, will cause in a few years over 3,000,000 tons of coal to be mined yearly from its property, giving the company a revenue of over \$300,000 annually. Many applications for leases have been received, but conditions and railroad facilities have not warranted the closing of additional leases.

Lumber—The Elk Horn Fuel Co. has, together with its fee lands and mineral rights, a large area of timber lands, and now has operating seven saw mills having a total daily capacity of 150,000 ft.

Gas and Oil—The probabilities are strong that both oil and gas will be found in these lands; about 80% of the oil and gas rights are owned by the company.

CONDENSED GENERAL BALANCE SHEET DEC. 31, 1913 (TOTAL EACH SIDE, \$31,278,560).

Assets:	Liabilities:
Real est. & coal lands.....	\$23,482,104
*Stocks of other co's.....	7,298,390
Advances to subsid. co's...	35,312
Deferred debit items.....	20,083
Cash.....	81,814
Demand loans.....	335,081
Supplies, etc.....	18,590
Miscellaneous.....	7,186
	Capital stock, common....
	Capital stock, preferred....
	1st M. notes.....
	Unpaid vouchers.....
	Pay-rolls.....
	Accrued interest on notes...
	Accounts payable.....
	Surplus.....

*Include 43,715 shares Consolidation Coal Co., 12,000 shares Mineral Fuel Co., 7,879 shares Beaver Creek Consol. Coal Co., 1,800 shares Tennis Coal Co., 500 shares York Coal & Coke Co.

An issue of \$200,000 first mortgage, 6% bonds was made by the Hocking Coal Co., the bonds dated July 1, 1912, and due July 1, 1932. They are unconditionally guaranteed by the Minneapolis & St. Louis R.R. The entire capital stock of the coal company was purchased by the railroad company about five years ago; the consideration was \$550,000, and \$350,000 have since been expended in improvements and extensions. The property embraces 4500 acres of coal land, including two modern shafts and 317 dwelling houses, store building, etc., all located in Monroe County, Iowa.